Attachment A

Flow Frequency Analysis Memo

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
James River Genco, LLC – VA0073300

TO: Drew Hammond, P.E.

FROM: Jennifer Palmore, P.G.

DATE: May 7, 2012

COPIES: File

The James River Genco cogeneration facility discharges to Gravelly Run in Hopewell, VA. The outfall is located at rivermile 2-GRV000.88. Stream flow frequencies have been requested for use in developing effluent limitations for the VPDES permit.

The expected natural background flow in Gravelly Run has been calculated. The VDEQ conducted flow measurements on Bailey Creek from 1929 through 1998. The measurements were made upstream of the confluence with Cattail Creek at the Route 156 bridge in Hopewell, VA and were correlated with the same day daily mean values from the continuous record gage on Deep Creek near Mannboro (#02041000). The measurements and daily mean values were plotted on a logarithmic graph and a best-fit power trendline was drawn through the data points. The regression trend line equation was then used to calculate the Bailey Creek flow frequencies from the reference gage flow frequencies. The flows for Gravelly Run were calculated using drainage area proportion between the measuring site on Bailey Creek and the discharge point. The data for the reference gage, the measurement site, and the discharge point are presented below.

Deep Creek near Mannboro, VA (#02041000):
Drainage area: 158 mi^2
Statistical period: 1947-2003
High flow months: December -April

1Q30 = 0.21 cfs	High Flow 1Q10 = 25 cfs
1Q10 = 0.80 cfs	High Flow 7Q10 = 29 cfs
7Q10 = 1.0 cfs	High Flow 30Q10 = 46 cfs
30Q10 = 2.8 cfs	HM = undetermined
30Q5 = 5.3 cfs	

Bailey Creek at Route 156, Hopewell, VA (#02042080):
Drainage Area: 13.8 mi^2

1Q30 = 0.77 cfs	High Flow 1Q10 = 4.9 cfs
1Q10 = 1.3 cfs	High Flow 7Q10 = 5.2 cfs
7Q10 = 1.4 cfs	High Flow 30Q10 = 6.2 cfs
30Q10 = 2.1 cfs	HM = undetermined
30Q5 = 2.7 cfs	

Gravelly Run at discharge
Drainage area: 0.48 mi^2

1Q30 = 0.027 cfs (0.017 MGD)	High Flow 1Q10 = 0.17 cfs (0.11 MGD)
1Q10 = 0.045 cfs (0.029 MGD)	High Flow 7Q10 = 0.18 cfs (0.12 MGD)
7Q10 = 0.049 cfs (0.032 MGD)	High Flow 30Q10 = 0.22 cfs (0.14 MGD)
30Q10 = 0.073 cfs (0.047 MGD)	HM = undetermined
30Q5 = 0.093 cfs (0.060 MGD)	

However, Gravelly Run consists almost entirely of effluent, with the majority coming from Honeywell, Inc. - Hopewell (VA0005291). Gravelly Run serves as an allocated impact zone for the Honeywell discharge and the effluent limits for the Honeywell permit are based on dilution ratios which will protect instream water quality in the James River.

The Honeywell-Hopewell discharge flow has been requested. Based on DMR data from January 2000 – March 2012, the minimum combined 30-day average flow from Honeywell's outfalls 001 and 002 is 63.89 MGD.

Gravelly Run should be considered a Tier 1 water.

During the 2010 305(b)/303(d) Water Quality Assessment, nontidal Gravelly Run was considered a Category 2B water ("Waters are of concern to the state but no Water Quality Standard exists for a specific pollutant, or the water exceeds a state screening value or toxicity test.") The Fish Consumption Use is considered fully supporting with observed effects due to the VDH fish consumption advisory for kepone. The Aquatic Life Use is fully supporting. The Wildlife and Recreation Uses were not assessed.

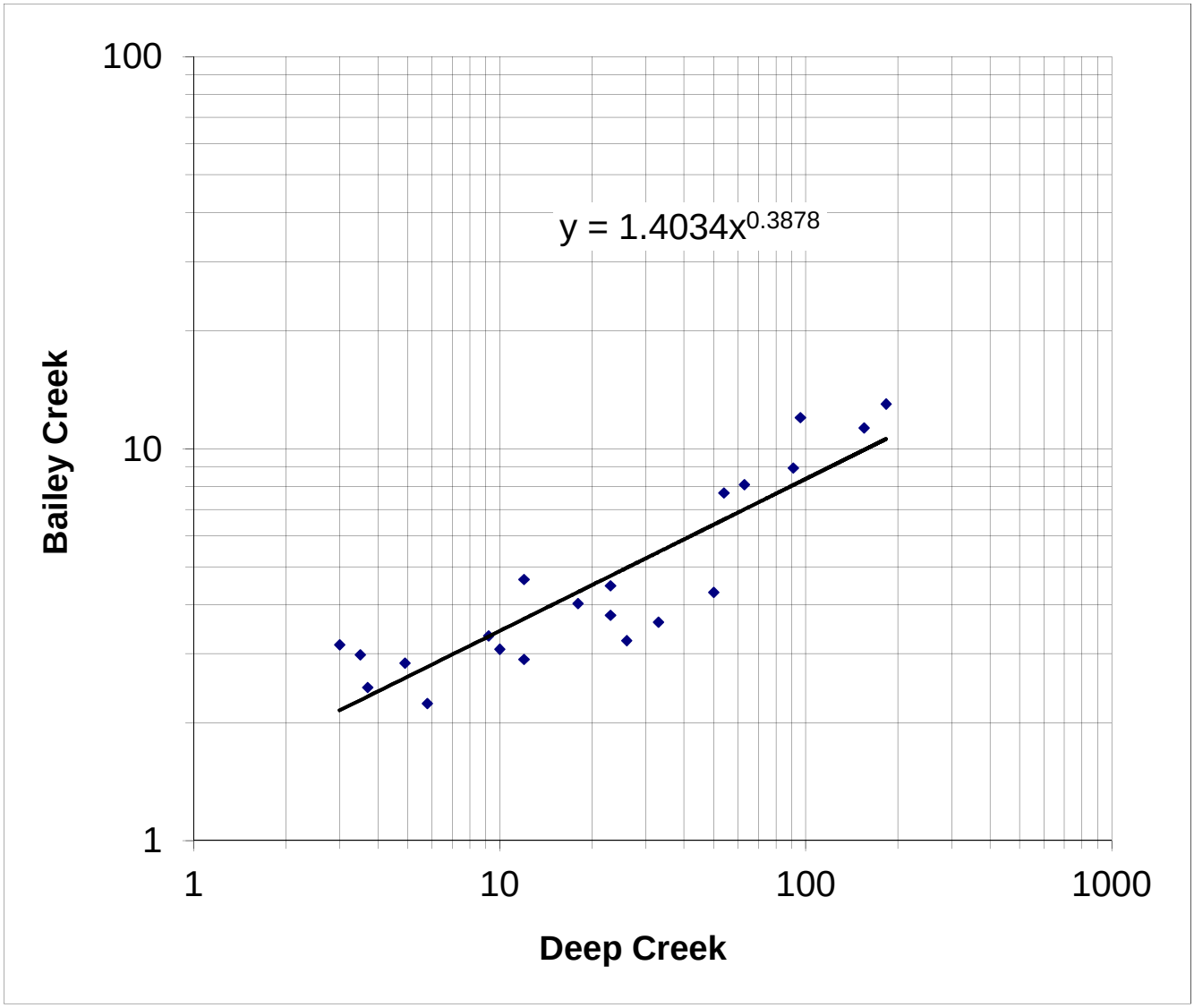
The bacterial TMDL for the James River (Hopewell to Westover) was approved by the EPA on 7/10/2008 and by the SWCB on 4/28/2009. The facility was addressed in the TMDL modeling. However, as the facility is not permitted for fecal coliform control, it was determined that they do not require a wasteload allocation.

The Chesapeake Bay TMDL was approved by the EPA on 12/29/2010. The TMDL allocates loads for total nitrogen, total phosphorus, and total suspended solids to protect the dissolved oxygen and submerged aquatic vegetation criteria in the Chesapeake Bay and its tidal tributaries. James River Genco was included in the aggregated loads for non-significant wastewater dischargers in the lower James River Tidal Freshwater segment (JMSTF1). The nutrient allocations are administered through the Watershed Nutrient General Permit; the TSS allocations are considered aggregated and facilities with technology-based TSS limits are considered to be in conformance with the TMDL.

If you have any questions concerning this analysis or need additional information, please let me know.

Bailey Creek at Hopewell, VA #02042080 *Regression Analysis*

vs Deep Creek near Mannboro, VA #02041000



Flow Data (cfs)

Date	Deep	Bailey
4/1/1929	-	21.0
10/4/1977	12	2.9
1/12/1978	183	13
10/2/1991	12	4.64
11/14/1991	50	4.30
9/2/1992	18	4.03
7/28/1993	9.2	3.33
9/20/1993	3.5	2.98
3/17/1994	155	11.3
7/8/1994	26	3.24
9/21/1994	10	3.08
2/27/1995	63	8.10
4/18/1995	54	7.71
8/15/1995	33	3.61
9/12/1995	5.8	2.24
4/25/1996	91	8.93
6/24/1996	23	3.76
5/12/1997	96	12.0
6/26/1997	23	4.47
10/9/1997	4.9	2.84
8/24/1998	3.0	3.16
9/28/1998	3.7	2.46

Regression Statistics	
Multiple R	0.940
R Square	0.884
Adjusted R Square	0.878
Standard Error	1.178
Observations	21

Flow Frequencies (cfs)

	Deep	Bailey	Gravelly
1Q30	0.21	0.77	0.027
1Q10	0.80	1.3	0.045
7Q10	1.0	1.4	0.049
30Q10	2.8	2.1	0.073
30Q5	5.3	2.7	0.093
HF1Q10	25	4.9	0.17
HF7Q10	29	5.2	0.18
HF30Q10	46	6.2	0.22
HM	-	-	-
DA	158	13.8	0.48
	Dec-Apr		
	1947-2003		

Facility Name:Honeywell International Incorporated - Hopewell
Permit No:VA0005291

Outfall Number	Parameter Code	Due Date	Quant Avg	Outfall Numb	Parameter	Due Date	Quant Avg
001	001	10-Feb-00	70.06	002	001	10-Feb-00	31.98
		10-Mar-00	71.14			10-Mar-00	36.63
		10-Apr-00	75.72			10-Apr-00	40.53
		10-May-00	81.35			10-May-00	40.41
		10-Jun-00	84.78			10-Jun-00	45.97
		10-Jul-00	87.01			10-Jul-00	43.34
		10-Aug-00	84.51			10-Aug-00	50.87
		10-Sep-00	87.65			10-Sep-00	48.07
		10-Oct-00	87.22			10-Oct-00	48.56
		10-Nov-00	80.75			10-Nov-00	43.92
		10-Dec-00	76.21			10-Dec-00	40.8
		10-Jan-01	71.64			10-Jan-01	32.74
		10-Feb-01	68.9			10-Feb-01	31.82
		10-Mar-01	64.99			10-Mar-01	34.43
		10-Apr-01	70.63			10-Apr-01	38.81
		10-May-01	74.48			10-May-01	38.38
		10-Jun-01	78.37			10-Jun-01	40.17
		10-Jul-01	84.47			10-Jul-01	39.47
		10-Aug-01	84.13			10-Aug-01	38.5
		10-Sep-01	74.28			10-Sep-01	48.43
		10-Oct-01	77.63			10-Oct-01	48.15
		10-Nov-01	74.82			10-Nov-01	43.7
		10-Dec-01	75.68			10-Dec-01	34.54
		10-Jan-02	75.16			10-Jan-02	32.88
		10-Feb-02	71.72			10-Feb-02	29.67
		10-Mar-02	75.99			10-Mar-02	32.68
		10-Apr-02	71.04			10-Apr-02	33.13
		10-May-02	75.08			10-May-02	37.89
		10-Jun-02	75.22			10-Jun-02	45.53
		10-Jul-02	83.81			10-Jul-02	40.87
		10-Aug-02	85.93			10-Aug-02	45.42
		10-Sep-02	83.55			10-Sep-02	50.07
		10-Oct-02	81.61			10-Oct-02	49.85
		10-Nov-02	78.5			10-Nov-02	45.57
		10-Dec-02	76.15			10-Dec-02	41.47
		10-Jan-03	70.9			10-Jan-03	34.23
		10-Feb-03	68.83			10-Feb-03	34.15
		10-Mar-03	66.17			10-Mar-03	34.16
		10-Apr-03	69.15			10-Apr-03	37.48
		10-May-03	67.55			10-May-03	33.94
		10-Jun-03	74.49			10-Jun-03	40.83
		10-Jul-03	78.17			10-Jul-03	44.83
		10-Aug-03	78			10-Aug-03	48.3
		10-Sep-03	83.25			10-Sep-03	48.96
		10-Oct-03	75.52			10-Oct-03	46.83
		10-Nov-03	72.61			10-Nov-03	38.67
		10-Dec-03	71.99			10-Dec-03	35.23
		10-Jan-04	69.65			10-Jan-04	30.83
		10-Feb-04	64.31			10-Feb-04	32.62
		10-Mar-04	64.03			10-Mar-04	34.75
		10-Apr-04	69.05			10-Apr-04	37.69
		10-May-04	68.85			10-May-04	37.14

Facility Name:Honeywell International Incorporated - Hopewell
Permit No:VA0005291

Outfall Number	Parameter Code	Due Date	Quant Avg	Outfall Numb	Parameter	Due Date	Quant Avg
		10-Jun-04	80.72			10-Jun-04	44.39
		10-Jul-04	79.86			10-Jul-04	46.39
		10-Aug-04	80.02			10-Aug-04	48.51
		10-Sep-04	81.54			10-Sep-04	47.74
		10-Oct-04	79.88			10-Oct-04	44.41
		10-Nov-04	77.88			10-Nov-04	44.96
		10-Dec-04	72.78			10-Dec-04	42.13
		10-Jan-05	67.72			10-Jan-05	37.01
		10-Feb-05	65.05			10-Feb-05	35.42
		10-Mar-05	63.96			10-Mar-05	39.29
		10-Apr-05	61.93			10-Apr-05	35.82
		10-May-05	68.75			10-May-05	40.25
		10-Jun-05	76.11			10-Jun-05	43.31
		10-Jul-05	80.13			10-Jul-05	46.91
		10-Aug-05	77.67			10-Aug-05	49.37
		10-Sep-05	81.35			10-Sep-05	49.21
		10-Oct-05	80.88			10-Oct-05	47.93
		10-Nov-05	76.27			10-Nov-05	42.69
		10-Dec-05	75.76			10-Dec-05	34.39
		10-Jan-06	40.32			10-Jan-06	34.5
		10-Feb-06	70.79			10-Feb-06	35.09
		10-Mar-06	73.06			10-Mar-06	35.5
		10-Apr-06	73.61			10-Apr-06	38.36
		10-May-06	78.74			10-May-06	44.73
		10-Jun-06	79.8			10-Jun-06	46.75
		10-Jul-06	73.69			10-Jul-06	48.48
		10-Aug-06	76.74			10-Aug-06	50.4
		10-Sep-06	76.17			10-Sep-06	50.25
		10-Oct-06	62.69			10-Oct-06	34.28
		10-Nov-06	56.68			10-Nov-06	35.09
		10-Dec-06	52.41			10-Dec-06	34.35
		10-Jan-07	51.23			10-Jan-07	34.32
		10-Feb-07	51.41			10-Feb-07	36.58
		10-Mar-07	48.25			10-Mar-07	32.71
		10-Apr-07	52.24			10-Apr-07	33.66
		10-May-07	57.14			10-May-07	38.09
		10-Jun-07	63			10-Jun-07	47.23
		10-Jul-07	69.94			10-Jul-07	50.66
		10-Aug-07	67.26			10-Aug-07	51.58
		10-Sep-07	65.22			10-Sep-07	43.02
		10-Oct-07	72.97			10-Oct-07	43.8
		10-Nov-07	72.96			10-Nov-07	45.44
		10-Dec-07	65.07			10-Dec-07	41.54
		10-Jan-08	60.15			10-Jan-08	34.92
		10-Feb-08	59.01			10-Feb-08	28.9
		10-Mar-08	60.12			10-Mar-08	32.35
		10-Apr-08	59.77			10-Apr-08	36.88
		10-May-08	65.52			10-May-08	41.12
		10-Jun-08	68.04			10-Jun-08	44.28
		10-Jul-08	72.51			10-Jul-08	49.68
		10-Aug-08	72.48			10-Aug-08	48.73
		10-Sep-08	71.1			10-Sep-08	47.4

Facility Name:Honeywell International Incorporated - Hopewell
Permit No:VA0005291

Outfall Number	Parameter Code	Due Date	Quant Avg	Outfall Numb	Parameter	Due Date	Quant Avg
		10-Oct-08	67.17			10-Oct-08	46.33
		10-Nov-08	59.7			10-Nov-08	45.64
		10-Dec-08	56.29			10-Dec-08	37.7
		10-Jan-09	48.45			10-Jan-09	28.75
		10-Feb-09	39.7			10-Feb-09	24.19
		10-Mar-09	45.93			10-Mar-09	30.39
		10-Apr-09	49.92			10-Apr-09	35.72
		10-May-09	55.81			10-May-09	37.52
		10-Jun-09	58.7			10-Jun-09	40.37
		10-Jul-09	54.41			10-Jul-09	34.42
		10-Aug-09	64.13			10-Aug-09	39.1
		10-Sep-09	66.59			10-Sep-09	42.16
		10-Oct-09	65.44			10-Oct-09	42.94
		10-Nov-09	58.27			10-Nov-09	35.42
		10-Dec-09	52.22			10-Dec-09	28.07
		10-Jan-10	47.78			10-Jan-10	29.05
		10-Feb-10	49.25			10-Feb-10	32.42
		10-Mar-10	45.36			10-Mar-10	29.11
		10-Apr-10	52.63			10-Apr-10	36.89
		10-May-10	51.24			10-May-10	38.61
		10-Jun-10	63.05			10-Jun-10	46.59
		10-Jul-10	67.43			10-Jul-10	51.48
		10-Aug-10	72.5			10-Aug-10	52.89
		10-Sep-10	71.47			10-Sep-10	51.21
		10-Oct-10	69.7			10-Oct-10	50.89
		10-Nov-10	62.55			10-Nov-10	39.14
		10-Dec-10	52.89			10-Dec-10	36.42
		10-Jan-11	42.27			10-Jan-11	33.84
		10-Feb-11	52.79			10-Feb-11	34.07
		10-Mar-11	53.82			10-Mar-11	35.29
		10-Apr-11	45.06			10-Apr-11	31.13
		10-May-11	48.47			10-May-11	34.99
		10-Jun-11	59.71			10-Jun-11	44.42
		10-Jul-11	66.65			10-Jul-11	44.65
		10-Aug-11	70			10-Aug-11	44.28
		10-Sep-11	71.21			10-Sep-11	43.56
		10-Oct-11	65.69			10-Oct-11	44.22
		10-Nov-11	67.32			10-Nov-11	40.1
		10-Dec-11	61.14			10-Dec-11	39.89
		10-Jan-12	56.48			10-Jan-12	38
		10-Feb-12	58.18			10-Feb-12	37.98
		10-Mar-12	57.18			10-Mar-12	38.76
		10-Apr-12	61.21			10-Apr-12	42.09
		Minimum	**39.70**			**Minimum**	**24.19**
						Total	**63.89**

Attachment B

Facility Flow Diagram

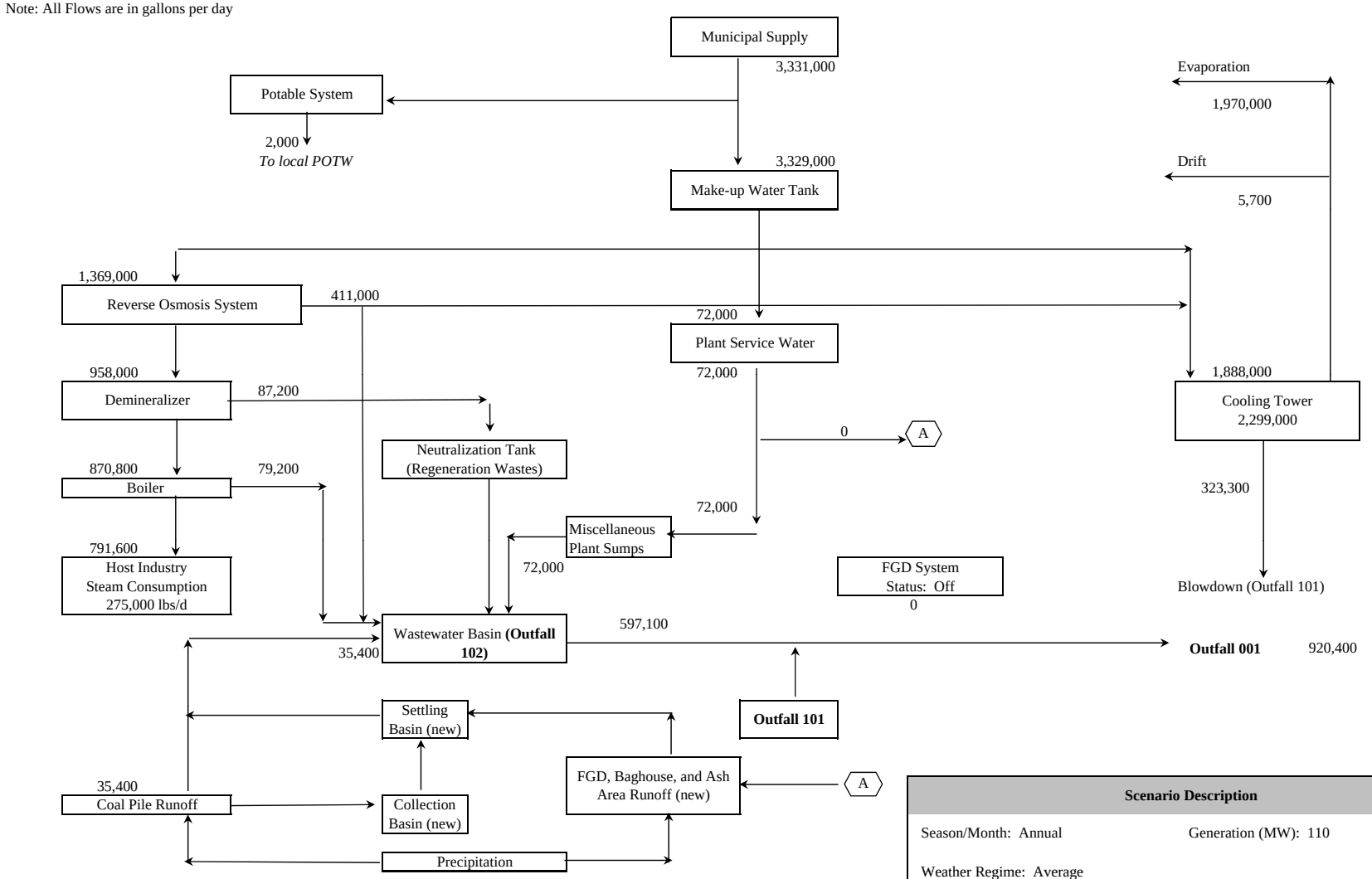


Figure 1. Water Balance for the James River Genco LLC (Hopewell Plant): Average Annual Operating Scenario - FGD Status as shown

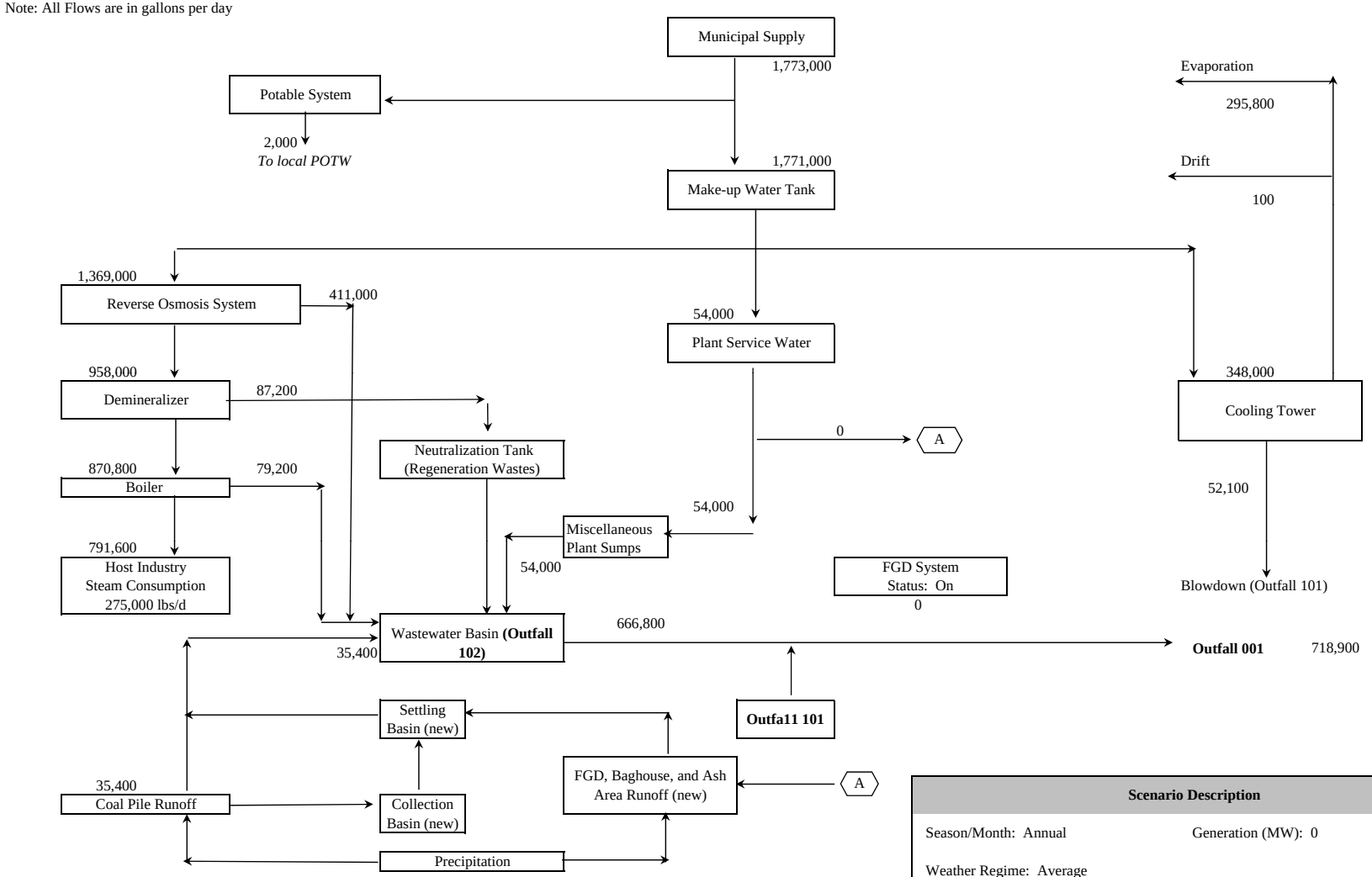


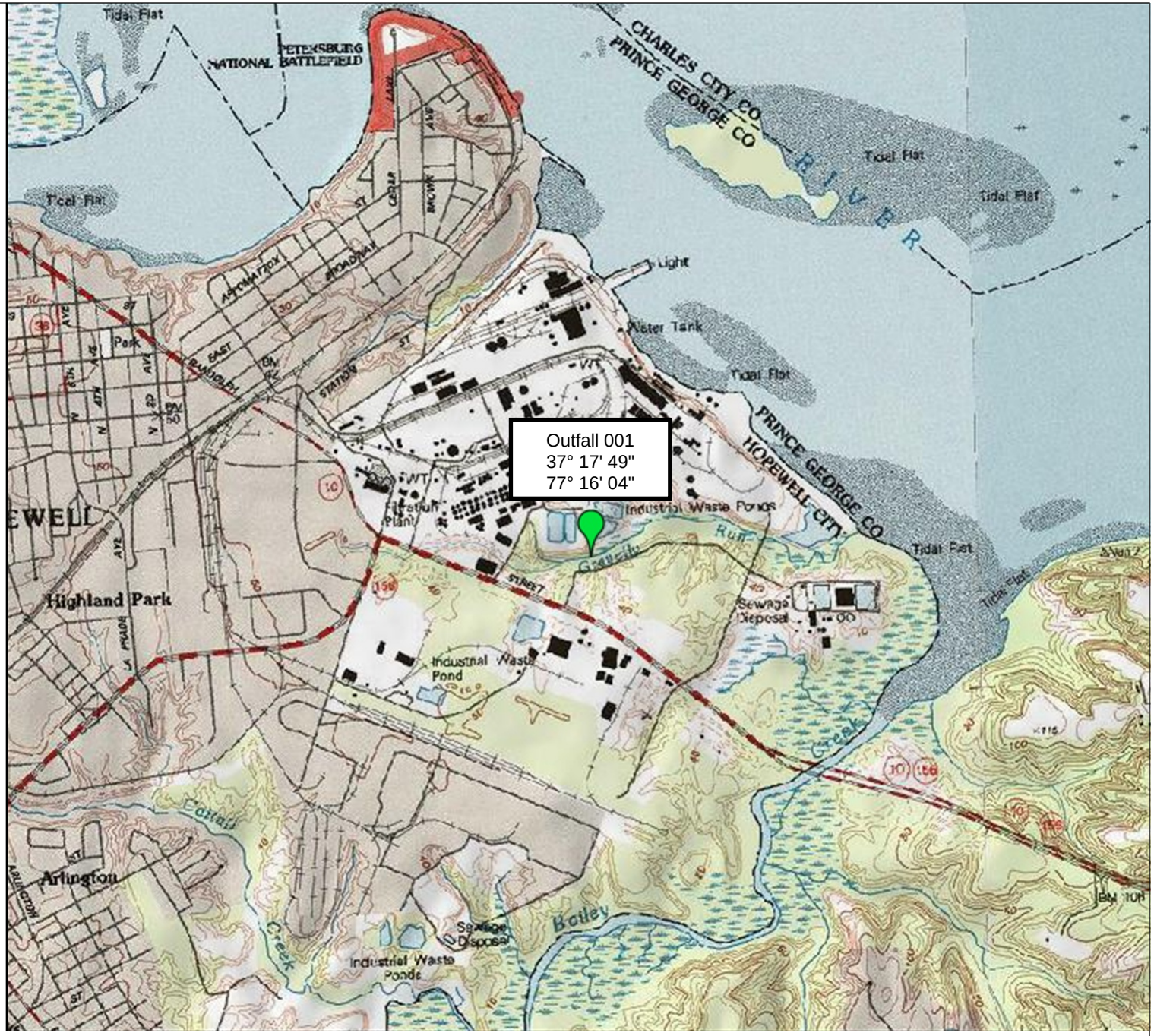
Figure 1. Water Balance for the James River Genco LLC (Hopewell Plant): Average Annual Operating Scenario - FGD Status as shown

Attachment C

Topographic Map

Map Export

Legend



Feet

0 500 1000 1500 2000

Map Scale: 1:24,000

Attachment D

James River Genco, LLC Tankage & Totes

James River Genco, LLC Tankage

Wastewater Pretreatment	Sodium Hydroxide (550 Gallons)	In containment
	Sulfuric Acid (1000 Gallons)	In containment
Fire Pumphouse	Diesel Fuel (300 Gallons)	In containment
Demin Bulding	Sodium Hydroxide (5000 Gallons)	In containment
	Sodium Hydroxide (850 Gallons)	In containment
	Sodium Hydroxide (125 Gallons)	In containment
	Sulfuric Acid (5000 Gallons)	In containment
	Sulfuric Acid (500 Gallons)	In containment
	Sulfuric Acid (100 Gallons)	In containment
	Sulfuric Acid (100 Gallons)	In containment
	Sulfuric Acid (100 Gallons)	In containment
Cooling Tower Chemical Treatment	Continium ACE (2000 Gallons)	In containment
Unit One Boiler Chemical Treatment	Optisperse (100 Gallons)	Inside Main Boiler Building
	Optisperse (100 Gallons)	Inside Main Boiler Building
	Optisperse (100 Gallons)	Inside Main Boiler Building
	Cortrol (100 Gallons)	Inside Main Boiler Building
	Cortrol (100 Gallons)	Inside Main Boiler Building
	Steamate (100 Gallons)	Inside Main Boiler Building
Unit Two Boiler Chemical Treatment	Optisperse (100 Gallons)	Inside Main Boiler Building
	Optisperse (100 Gallons)	Inside Main Boiler Building
	Optisperse (100 Gallons)	Inside Main Boiler Building
	Cortrol (100 Gallons)	Inside Main Boiler Building
	Cortrol (100 Gallons)	Inside Main Boiler Building
	Steamate (100 Gallons)	Inside Main Boiler Building
Lube Oil Storage Room	Used Oil (250 Gallons)	Inside Main Boiler Building & Secondary Containment
	Kerosene (100 Gallons)	Inside Main Boiler Building & Secondary Containment

James River Genco, LLC Tankage (cont.)

Coal Yard	Diesel Fuel (500 Gallons)	In Containment
	Diesel Fuel (500 Gallons)	In Containment

James River Genco, LLC Totes

Wastewater Pretreatment	POLYFLOC AE1703 * (Plastic Tote)	In containment
	Novus CE2654 * (Plastic Tote)	In containment
	Novus CE2688 * (Plastic Tote)	In containment
	Klaraid IC1172 * (Plastic Tote)	In containment

* These polymers are not necessarily utilized and/or stored on-site at all times. When they are used, the totes are stored on-site, in containment, in the wastewater basin pretreatment area.

Attachment E

Honeywell-Hopewell Effluent Data
Flow Weighted Average Calculations

Honeywell - Hopewell
VPDES Permit No. VA0005291
Ouftall 001

DMR Due Date	Flow		pH	
	Monthly Avg. MGD	Maximum MGD	Minimum s.u.	Maximum s.u.
3/10/2009	45.93	58.91	6.6	7.9
4/10/2009	49.92	61.9	6.4	7.6
5/10/2009	55.81	65.91	6.5	8.3
6/10/2009	58.7	66.36	6.5	7.9
7/10/2009	54.41	68	6.3	7.4
8/10/2009	64.13	72.96	6.8	8.0
9/10/2009	66.59	72.33	6.7	7.7
10/10/2009	65.44	68.81	6.6	7.5
11/10/2009	58.27	70.5	6.2	7.7
12/10/2009	52.22	68.62	6.2	7.3
1/10/2010	47.78	59.23	6.1	8.3
2/10/2010	49.25	53.26	6.3	8.3
3/10/2010	45.36	49.53	4.7	8.6
4/10/2010	52.63	63.08	6.2	8.7
5/10/2010	51.24	59.03	6.2	8.7
6/10/2010	63.05	69.47	6.5	7.8
7/10/2010	67.43	81.16	6.4	8.7
8/10/2010	72.5	79.23	6.4	7.6
9/10/2010	71.47	82.95	6.8	8.0
10/10/2010	69.7	78.31	6.9	7.6
11/10/2010	62.55	71.14	6.7	8.0
12/10/2010	52.89	63.77	6.5	8.1
1/10/2011	42.27	52.93	6.5	9.0
2/10/2011	52.79	64.14	5.9	9.1
3/10/2011	53.82	80.81	6.1	8.0
4/10/2011	45.06	61.16	2.5	9.3
5/10/2011	48.47	61.08	6.0	8.7
6/10/2011	59.71	67.15	6.6	7.9
7/10/2011	66.65	75.95	3.5	8.2
8/10/2011	70	86.43	6.1	8.0
9/10/2011	71.21	84.62	6.7	7.6
10/10/2011	65.69	83.22	6.6	8.1
11/10/2011	67.32	77.23	6.1	9.3
12/10/2011	61.14	65.94	6.5	7.6
1/10/2012	56.48	61.59	6.0	8.9
2/10/2012	58.18	67.39	6.1	8.8
			90%	9.0
			10%	7.6

Honeywell - Hopewell
VPDES Permit No. VA0005291
Ouftall 002

DMR Due Date	Flow		pH	
	Monthly Avg. MGD	Maximum MGD	Minimum s.u.	Maximum s.u.
3/10/2009	30.39	36.14	6.6	8.0
4/10/2009	35.72	49.86	6.9	8.0
5/10/2009	37.52	43.73	6.8	8.0
6/10/2009	40.37	47.23	6.7	7.7
7/10/2009	34.42	44.64	7.0	7.9
8/10/2009	39.1	45.82	7.1	8.6
9/10/2009	42.16	47.61	6.6	8.3
10/10/2009	42.94	48.94	6.7	8.1
11/10/2009	35.42	47.17	6.3	7.9
12/10/2009	28.07	35.08	6.5	7.6
1/10/2010	29.05	33.47	6.4	7.4
2/10/2010	32.42	36.28	6.1	7.8
3/10/2010	29.11	38.85	5.8	7.9
4/10/2010	36.89	43.4	6.1	7.8
5/10/2010	38.61	46.61	6.7	8.0
6/10/2010	46.59	58.56	6.8	8.0
7/10/2010	51.48	69.14	5.8	8.3
8/10/2010	52.89	62.57	6.4	8.7
9/10/2010	51.21	55.77	6.4	8.4
10/10/2010	50.89	60.9	6.2	8.6
11/10/2010	39.14	51.85	6.7	8.2
12/10/2010	36.42	45.23	6.8	8.6
1/10/2011	33.84	42.93	5.9	8.5
2/10/2011	34.07	38.37	6.4	8.4
3/10/2011	35.29	42.21	6.5	8.0
4/10/2011	31.13	51.23	4.5	9.4
5/10/2011	34.99	45.8	6.7	8.0
6/10/2011	44.42	49.39	6.3	7.9
7/10/2011	44.65	54.6	1.9	8.3
8/10/2011	44.28	50.3	6.1	8.2
9/10/2011	43.56	56.27	6.4	8.2
10/10/2011	44.22	47.13	6.2	9.5
11/10/2011	40.1	54.39	6.5	7.9
12/10/2011	39.89	46.32	6.4	8.7
1/10/2012	38	51.61	6.1	8.3
2/10/2012	37.98	41.22	6.6	8.4
			90%	8.7
			10%	7.8

Honeywell - Hopewell
VPDES Permit No. VA0005291
Ouftall 001
(Whole Effluent Toxicity Testing)

Date	Hardness mg/L as $CaCO_3$
9/14/2009	80
9/15/2009	93
9/17/2009	85
11/7/2010	70
11/9/2010	63
11/11/2010	70
10/16/2011	44
10/18/2011	50
10/20/2011	50
Avg.	67

Honeywell - Hopewell
VPDES Permit No. VA0005291
Ouftall 002
(Whole Effluent Toxicity Testing)

Date	Hardness mg/L as $CaCO_3$
9/14/2009	80
9/15/2009	80
9/17/2009	90
11/7/2010	65
11/9/2010	68
11/11/2010	70
10/2/2011	58
10/4/2011	50
10/6/2011	53
Avg.	68

HONEYWELL - HOPEWELL
OUTFALL 001

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): VAD065385296

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 001

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (*if available*) (2) MASS	d. NO. OF ANALYSES	3. UNITS (*specify if blank*) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	4. INTAKE b. NO. OF ANALYSES
a. Biochemical Oxygen Demand (*BOD*)	5	1067	NA	NA	NA	NA	1	mg/l	kg	3	1131	1
b. Chemical Oxygen Demand (*COD*)	16	3416	NA	NA	NA	NA	1	mg/l	kg	19	7161	1
c. Total Organic Carbon (*TOC*)	11	3113	1.4	403	0.9	249	365	mg/l	kg	5.9	2825	365
d. Total Suspended Solids (*TSS*)	22	4697	NA	NA	NA	NA	1	mg/l	kg	22	8291	1
e. Ammonia (*as N*)	10.9	3156	2.5	693.1	1.84	498	365	mg/l	kg	0.2	98	94
f. Flow	VALUE 90.94		VALUE 79.80		VALUE 74.0		365	MGD	NA	VALUE 127.1		365
g. Temperature (*winter*)	VALUE 27.0		VALUE 23.4		VALUE 23.4		90	°C		VALUE NA		NA
h. Temperature (*summer*)	VALUE 44.7		VALUE 41.6		VALUE 40.3		90	°C		VALUE NA		NA
i. pH	MINIMUM 2.8	MAXIMUM 8.5	MINIMUM 6.3	MAXIMUM 7.2			365	STANDARD UNITS				

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X" a. BELIEVED PRESENT	2. MARK "X" b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (*if available*) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE b. NO. OF ANALYSES
a. Bromide (24959-67-9)		X	0.013	2.78	NA	NA	NA	NA	1	mg/l	kg	0.013	4.9	1
b. Chlorine, Total Residual	X		NA	NA	NA	NA	NA	NA	NA	mg/l	kg	0.08	30.15	1
c. Color	X		50	NA	NA	NA	NA	NA	1	pcu	NA	65	NA	1
d. Fecal Coliform	X		50	NA	NA	NA	NA	NA	1	MPN/10	NA	500	NA	1
e. Fluoride (16984-48-8)	X		<0.10	<21.4	NA	NA	NA	NA	1	mg/l	kg	<0.10	<37.7	1
f. Nitrate-Nitrite (*as N*)	X		1.14	243.4	NA	NA	NA	NA	1	mg/l	kg			

HONEYWELL - HOPEWELL
OUTFALL 002

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): VAD065385296

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 002

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (*if available*) (2) MASS	d. NO. OF ANALYSES	3. UNITS (*specify if blank*) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	4. INTAKE b. NO. OF ANALYSES
a. Biochemical Oxygen Demand (*BOD*)	5	616	NA	NA	NA	NA	1	mg/l	kg	3	1131	1
b. Chemical Oxygen Demand (*COD*)	27	3327	NA	NA	NA	NA	1	mg/l	kg	19	7161	1
c. Total Organic Carbon (*TOC*)	9	1222	1.4	265	0.8	131	365	mg/l	kg	5.9	2825	365
d. Total Suspended Solids (*TSS*)	26	3204	NA	NA	NA	NA	1	mg/l	kg	22	8291	1
e. Ammonia (*as N*)	3.3	447	0.7	94	0.3	47	365	mg/l	kg	0.2	98	94
f. Flow	VALUE 66.4		VALUE 50.3		VALUE 41.7		365	MGD	NA	VALUE 127.1		365
g. Temperature (*winter*)	VALUE 26.7		VALUE 24.1		VALUE 23.7		90	°C		VALUE NA		NA
h. Temperature (*summer*)	VALUE 43.1		VALUE 40.3		VALUE 38.9		90	°C		VALUE NA		NA
i. pH	MINIMUM 6.1	MAXIMUM 8.7	MINIMUM 6.8	MAXIMUM 7.8			365	STANDARD UNITS				

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X" a. BELIEVED PRESENT	2. MARK "X" b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (*if available*) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE b. NO. OF ANALYSES
a. Bromide (24959-67-9)		X	0.013	1.6	NA	NA	NA	NA	1	mg/l	kg	0.013	4.9	1
b. Chlorine, Total Residual	X		NA	NA	NA	NA	NA	NA	NA	mg/l	kg	0.08	30.15	1
c. Color	X		55	NA	NA	NA	NA	NA	1	pcu	NA	65	NA	1
d. Fecal Coliform	X		300	NA	NA	NA	NA	NA	1	MPN/10	NA	500	NA	1
e. Fluoride (16984-48-8)	X		0.10	12.3	NA	NA	NA	NA	1	mg/l	kg	<0.10	<37.7	1
f. Nitrate-Nitrite (*as N*)	X		0.57	70	NA	NA	NA	NA	1	mg/l	kg			

Honeywell-Hopewell (VA0005291) | Flow Weighted Average (FWA) Calculations					
Outfall	Minimum 30-Day Average Flow MGD	Mean Hardness mg/L CaCO3	Maximum Daily Temp. °C	90% pH s.u.	10% pH s.u.
001	39.70	67	44.7	9.0	7.6
002	24.19	68	43.1	8.7	7.8
Total	63.89				
	FWA	67	44	8.9	7.7

Attachment F

Site Inspection Report

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Wastewater Facility Inspection Report

Facility Name:	James River Cogeneration Co.	**Facility No.:**	VA0073300
City/County:	City of Hopewell	**Inspection Agency:**	DEQ - PRO
Inspection Date:	April 19, 2011	**Date Form Completed:**	April 21, 2011
Inspector:	Mike Dare, Drew Hammond MDare 4-21-11	**Time Spent:**	16 hrs. w/ travel & report
Reviewed By:	4/27/11 4/22/11	**Unannounced Insp.?**	No
		FY-Scheduled Insp.?	Yes

Present at Inspection: Dana Rieves, Cheryl Sawyer, Lew Gove. Kerry Lamb and Mike Williams were on hand for opening comments only.

TYPE OF FACILITY:

Domestic		Industrial	
[ ] Federal	[ ] Major	[ ] Major	[ ] Primary
[ ] Non-Federal	[ ] Minor	[X] Minor	[ ] Secondary

Population Served: ***approx.: N/A – Domestic wastewater to Hopewell Regional WWTF***

Number of Connections: ***approx.: N/A***

TYPE OF INSPECTION:

[x] Routine — Date of last inspection: ***April 10, 2007***

[ ] Compliance — Agency: ***DEQ/PRO***

[ ] Reinspection

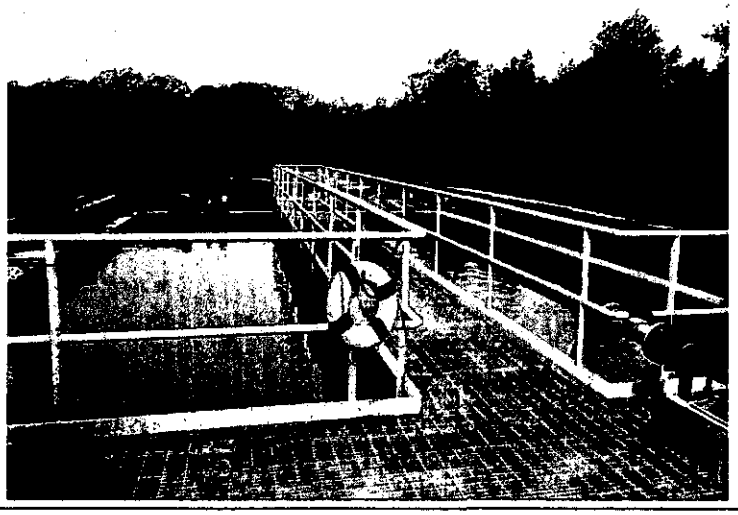
EFFLUENT MONITORING (outfall 001):

January 2011:	pH: 8.05 SU	Temperature: 11 deg C	Flow:0.5584 MGD (AVG.)
February 2011:	pH: 6.96 SU	Temperature: 31 deg C	Flow: 0.6516 MGD (AVG.)

CHANGES AND/OR CONSTRUCTION

A recent upgrade of the wastewater treatment system was performed to accommodate the wastewater associated with the installation of six scrubbers.

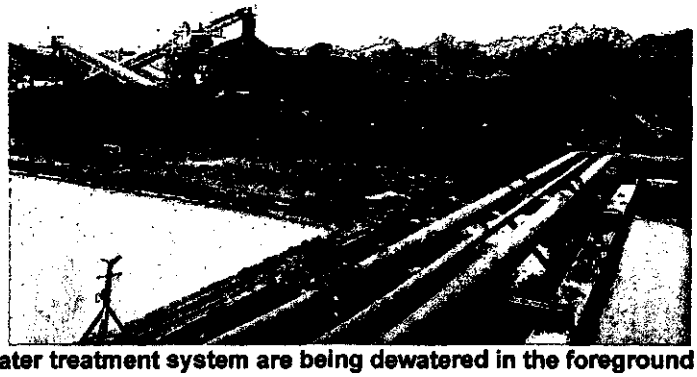
The settling basin in the photo at right was constructed as part of the upgrade and receives wastewater from the scrubber system.



(A) PLANT OPERATION AND MAINTENANCE

1.	Class and number of licensed operators: Class II – 1				
2.	Hours per day plant is staffed: 24 hours/day				
3.	Describe adequacy of staffing:		[ ] Good	[x] Average	[ ] Poor*
4.	Does the plant have an established program for training personnel?		[x] Yes	[ ] No	
5.	Describe the adequacy of the training program:		[x] Good	[ ] Average	[ ] Poor*
6.	Are preventive maintenance tasks scheduled?		[x] Yes	[ ] No*	
7.	Describe the adequacy of maintenance:		[x] Good	[ ] Average	[ ] Poor*
8.	Does the plant experience any organic/hydraulic overbading?		[ ] Yes*	[x] No	
	If yes, identify cause and impact on plant: N/A				
9.	Any bypassing since last inspection?	[x] Yes*	[ ] No		
10.	Is the on-site electric generator operational?	[ ] Yes	[ ] No*	[x] N/A	
11.	Is the STP alarm system operational?	[x] Yes	[ ] No*	[ ] N/A	
12.	How often is the standby generator exercised?	[ ] Weekly	[ ] Monthly	[x] Other: N/A	
	Power Transfer Switch?	[x] Weekly	[ ] Monthly	[x] Other: N/A	
	Alarm System?	[ ] Weekly	[ ] Monthly	[x] Other: N/A	
13.	When were the cross connection control devices last tested on the potable water service? ***The three units were tested and certified by a contractor on January 14, 2011.***				
14.	Is sludge disposed in accordance with the approved sludge disposal plan?		[x] Yes	[ ] No*	[ ] N/A
15.	Is septage received by the facility?	[ ] Yes	[x] No		
	Is septage loading controlled?	[ ] Yes	[ ] No *	[x] N/A	
	Are records maintained?	[ ] Yes	[ ] No*	[x] N/A	
16.	Overall appearance of facility:	[ ] Good	[x] Average	[ ] Poor*	

Comments: #4 Operators and Chemist receive vendor and cross training. #6 Preventive maintenance work orders are generated automatically. #9 Cooling tower overflow into stormwater system on 12/2/07; Neutralization tank discharge piping leak to stormwater system on 3/22/08; RO reject water leak to stormwater outfall system on 1/6/11; Neutralization tank overflow to stormwater system on 3/24/10. #11 Alarms associated with the wastewater treatment plant are high and low pH alarms at Outfalls 102 and 001 and are monitored at the control room. #14 Solids are removed as needed from the wastewater treatment system basins and placed in a containment structure at the coal pile area. These solids are periodically transported to a landfill.



Solids removed from the wastewater treatment system are being dewatered in the foreground of the above photo. Coal to be burned in the generation of electricity can be seen in the background.

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	[x] Yes	[ ] No*	[ ] N/A
Instrument maintenance and calibration	[x] Yes	[ ] No*	[ ] N/A
Mechanical equipment maintenance	[x] Yes	[ ] No*	[ ] N/A
Industrial waste contribution **(Municipal Facilities)**	[ ] Yes	[ ] No*	[x] N/A

2. What does the operational log contain?

Visual Observations	[x] Yes	[ ] No	[ ] N/A
Flow Measurement	[x] Yes	[ ] No	[ ] N/A
Laboratory Results	[x] Yes	[ ] No	[ ] N/A
Process Adjustments	[x] Yes	[ ] No*	[ ] N/A
Control Calculations	[x] Yes	[ ] No	[ ] N/A
Other:			

3. What do the mechanical equipment records contain:

As built plans and specs?	[x] Yes	[ ] No*	[ ] N/A
Spare parts inventory?	[x] Yes	[ ] No*	[ ] N/A
Manufacturers instructions?	[x] Yes	[ ] No*	[ ] N/A
Equipment/parts suppliers?	[x] Yes	[ ] No*	[ ] N/A
Lubrication schedules?	[x] Yes	[ ] No*	[ ] N/A
Other:			
Comments:	None		

4. What do the industrial waste contribution records contain: ***(Applicable to municipal facilities only)***

Waste characteristics?	[ ] Yes	[ ] No*	[x] N/A
Locations and discharge types?	[ ] Yes	[ ] No*	[x] N/A
Impact on plant?	[ ] Yes	[ ] No*	[x] N/A
Other:	N/A		
Comments:	None		

5. Are the following records maintained at the plant:

Equipment maintenance records	[x] Yes	[ ] No*	[ ] N/A
Operational Log	[x] Yes	[ ] No*	[ ] N/A
Industrial contributor records	[ ] Yes	[ ] No*	[x] N/A
Instrumentation records	[x] Yes	[ ] No*	[ ] N/A
Sampling and testing records	[x] Yes	[ ] No*	[ ] N/A

6. Are records maintained at a different location? [ ] Yes [x] No
   Where are the records maintained? ***All are available on site.***

7. Were the records reviewed during the inspection? [x] Yes [ ] No

8. Are the records adequate and the O & M Manual current? [x] Yes [ ] No* [ ] N/A
   O&M Manual date written: ***8/94 w/ subsequent revisions***
   Date DEQ approved O&M: ***Not confirmed***

9. Are the records maintained for required 3-year period? [x] Yes [ ] No*

Comments: It was reported that the O&M manual would be revised and submitted to the DEQ for review upon completion of a new chemical treatment basin system.

(C) SAMPLING

1.	Are sampling locations capable of providing representative samples?	[x] Yes	[ ] No*	[ ] N/A
2.	Do sample types correspond to those required by the permit?	[x] Yes	[ ] No*	[ ] N/A
3.	Do sampling frequencies correspond to those required by the permit?	[x] Yes	[ ] No*	[ ] N/A
4.	Are composite samples collected in proportion to flow?	[x] Yes	[ ] No*	[ ] N/A
5.	Are composite samples refrigerated during collection?	[x] Yes	[ ] No*	[ ] N/A
6.	Does plant maintain required records of sampling?	[x] Yes	[ ] No*	[ ] N/A
7.	Does plant run operational control tests?	[x] Yes	[ ] No*	[ ] N/A

Comments:

(D) TESTING

1. Who performs the testing?
   [x] Plant/ Lab
   [ ] Central Lab
   [x] Commercial Lab - Name: ***J.R. Reed & Assoc. – TSS, Oil & Grease, Cr, Zn and Biological testing***

If plant performs any testing, complete 2-4.

2. What method is used for chlorine analysis? ***HACH DR-2500 (Free Chlorine)***

3.	Is sufficient equipment available to perform required tests?	[x] Yes	[ ] No*	[ ] N/A
4.	Does testing equipment appear to be clean and/or operable?	[x] Yes	[ ] No*	[ ] N/A

Comments: Please see attached DEQ *Laboratory Inspection Report.*

(E) FOR INDUSTRIAL FACILITIES W/ TECHNOLOGY BASED LIMITS

1. Is the production process as described in the permit application? (If no, describe changes in comments)

   [x] Yes [ ] No* [ ] N/A

2. Do products and production rates correspond to the permit application? (If no, list differences in comments section)

   [ ] Yes [ ] No* [x] N/A

3. Has the State been notified of the changes and their impact on plant effluent?

   [ ] Yes [ ] No* [x] N/A

Comments: None

FOLLOW UP TO COMPLIANCE RECOMMENDATIONS FROM THE April 10, 2007 DEQ INSPECTION:

There were no compliance recommendations.

FOLLOW UP TO GENERAL RECOMMENDATIONS FROM THE April 10, 2007 DEQ INSPECTION:

There were no general recommendations.

INSPECTION REPORT SUMMARY

Compliance Recommendations/Request for Corrective Action:

There are no compliance recommendations at this time.

General Recommendations/Observations:

There are no general recommendations at this time.

Comments:

One of two generating units was down for routine maintenance at the time of inspection. Photos courtesy of James River Cogeneration Company.

Items evaluated during this inspection include (check all that apply):

[x] Yes	[ ] No		Operational Units
[x] Yes	[ ] No		O & M Manual
[x] Yes	[ ] No		Maintenance Records
[ ] Yes	[ ] No	[x] N/A	Pathogen Reduction & Vector Attraction Reduction
[x] Yes	[ ] No	[ ] N/A	Sludge Disposal Plan
[ ] Yes	[ ] No	[x] N/A	Groundwater Monitoring Plan
[x] Yes	[ ] No	[ ] N/A	Storm Water Pollution Prevention Plan ***See SW Inspection Report for VAR050553***
[x] Yes	[ ] No	[ ] N/A	Permit Special Conditions
[ ] Yes	[x] No	[ ] N/A	Permit Water Quality Chemical Monitoring
[x] Yes	[ ] No	[ ] N/A	Laboratory Records ***See Lab Report***

UNIT PROCESSES

General Overview: The discharges from outfalls 101 and 102 combine and flow to outfall 001.

Cooling Towers (Outfall 101): The cogeneration facility is made up of two independent power generating plants, each served by one of two 8-cell cooling towers. The blow down from the 2 cooling towers combines to form the discharge at Internal outfall 101. The towers are periodically dosed with sodium hypochlorite and sodium bromide. A dispersant is added to the cooling water to prevent mineral deposits in the towers. Each tower is equipped with an in-line magnetic flow meter. The cooling tower discharge is sampled from the upturned discharge pipe, located in the mixing chamber where the flow combines with flow from outfall 102.

Wastewater Basins (Outfall 102): Coal pile runoff, boiler blow down, WTP neutralization tank and settling basin effluents, turbine room sump and drop drain discharges from within the plant area - all drain to two concrete settling basins. The basins are generally operated one at a time. All influent combines in a common tank at the head of the basins. An in-line pH meter monitors the influent pH enabling Operators to adjust the pH prior to the basins. The wastewater flows from the common tank into the "basin header", a shallow trough that stills the water and allows most solids to settle. The trough is cleaned as needed with the solids being placed in a containment structure at the coal pile area. The wastewater spills over the top of the trough into the basin. Any floating material on the basin surface is kept from discharging via a baffle, curtain and oil absorbent booms located just ahead of the discharge weir. For mixing purposes, recirculation pumps are used to pull water from the end of each basin, prior to the discharge weir, and return it to the head of the basin. The basins have been equipped with air diffusers for use if needed. The settling basin overflow makes up Internal outfall 102.

Outfall 102 flow is the calculated difference of the metered flow values for outfall 001 and outfall 101.

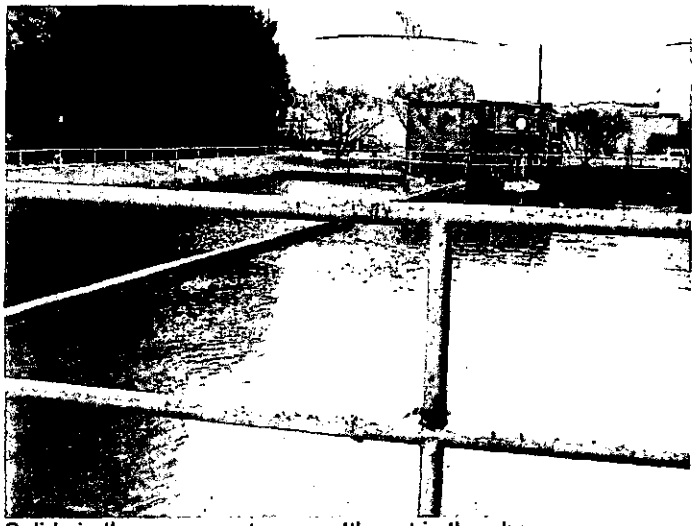
Coal Pile: Surface run-off from the coal pile area is captured by a perimeter "V-ditch" and conveyed, via gravity, to the wastewater basins. Solids removed from the wastewater basins are dewatered in the coal pile area. The solids are periodically hauled to a landfill.

Water Treatment Plant: The facility operates and maintains a water treatment plant to treat water for use in the boilers. The treatment system consists of 3 carbon filters, 2 cation columns, a decarbonization unit and 2 anion columns. The cationic and anionic resin columns treat varying amounts of water between recharging. The cationic resin recharges with sulfuric acid; the anionic resin with caustic soda. The carbon filters are backwashed periodically. All wastewater from the WTP is collected in the neutralization tank before going to the wastewater basins. One blower provides mixing to the neutralization tank when needed.

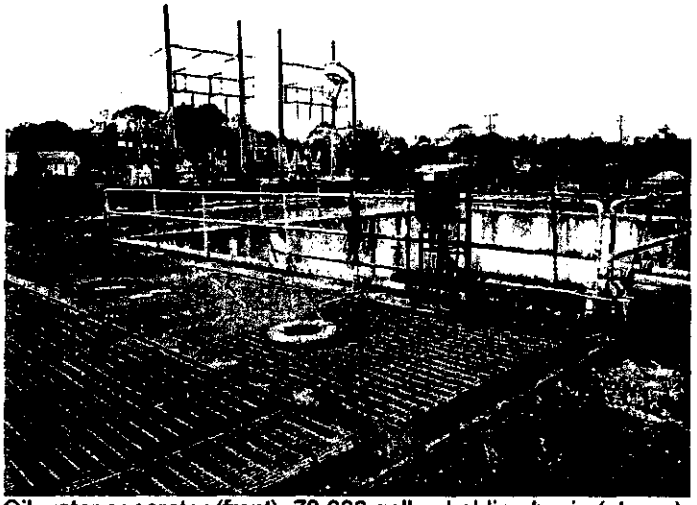
Outfall 001: From the mixing chamber the combined flow from outfalls 101 and 102 enter the final outfall 001 vault. pH is continuously monitored here, with low and high pH alarms. H_2SO_4 and caustic soda are automatically fed as needed to adjust pH. At the time of the inspection the continuous monitor read 7.57 S.U.

Miscellaneous:

An onsite **Oil-Water Separator** receives stormwater from lube oil AST and transformer containment areas. Flow enters a two cell oil-water separator. Discharge from the oil-water separator enters a 78,000 gallon holding basin. The basin is equipped with two pumps that are operated manually as required to pump the water to the stormwater system. The basin allows for a visual inspection of the water prior to being pumped.



Solids in the process stream settle out in the above wastewater basins



Oil-water separator (front); 78,000 gallon holding basin (at rear)

UNIT PROCESS: Flow Measurement

(VPDES Outfall No.001)

1.	Type measuring device:	*Parshall Flume, bubbler/head differential with totalizer*		
2.	Present reading:	*Not ascertained*		
3.	Bypass channel?	[ ] Yes	[x] No	
	Metered?	[ ] Yes	[ ] No*	[x] N/A
4.	Return flows discharged upstream from meter?	[ ] Yes	[x] No	
	If Yes, identify:	N/A		
5.	Device operating properly?	[x] Yes	[ ] No*	
6.	Date of last calibration:	*September 16, 2010*		
7.	Evidence of following problems:			
	a. Obstructions?	[ ] Yes*	[x] No	
	b. Grease?	[ ] Yes*	[x] No	
8.	General condition:	[x] Good	[ ] Fair	[ ] Poor*

Comments: *None*

UNIT PROCESS: VPDES Outfall No.001

1.	Type outfall:	[ ] Shore based	[ ] Submerged	Not observed		
2.	Type if shore based:	[ ] Wingwall	[ ] Headwall	[ ] Rip Rap	[ ] N/A	
3.	Flapper valve?	[ ] Yes	[ ] No			
4.	Erosion of bank?	[ ] Yes*	[ ] No	[ ] N/A		
5.	Effluent plume visible?	[ ] Yes *	[ ] No			

Comments: The effluent discharge was clear at the final outfall vault. Outfall 001 discharges to a remote, effluent dominated, stream on Honeywell property located on the opposite side of Route 10.

6.	Condition of outfall and supporting structures:	[ ] Good	[ ] Fair	[ ] Poor *	Not observed
7.	Final effluent, evidence of following problems:				
	a. Oil sheen?	[ ] Yes*	[x] No		
	b. Grease?	[ ] Yes*	[x] No		
	c. Sludge bar?	[ ] Yes*	[x] No		
	d. Turbid effluent?	[ ] Yes*	[x] No		
	e. Visible foam?	[ ] Yes*	[x] No		
	f. Unusual odor?	[ ] Yes*	[x] No	*Comments: The effluent was observed at the final outfall vault.*	

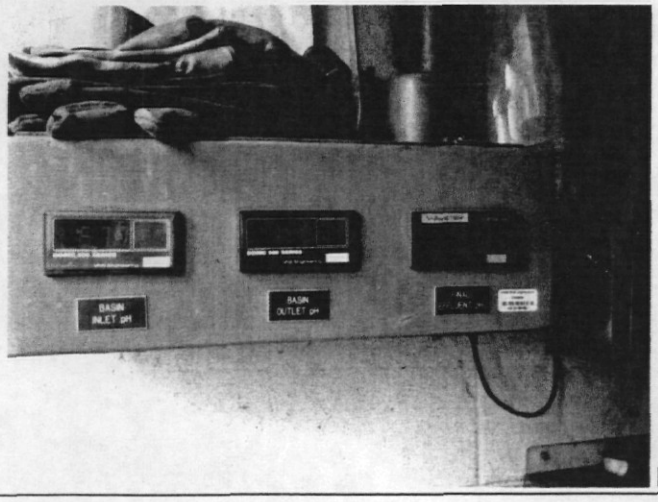


Photo is of wastewater basin pH transmitter

Attachment G

Effluent DMR Data

James River Genco, LLC
VPDES Permit No. VA0073300
Outfall 001

DMR	Flow		pH		Temperature
Due	Monthly Avg.	Maximum	Minimum	Maximum	Maximum
Date	MGD	MGD	s.u.	s.u.	℃
3/10/2009	0.6297	0.8352	7.88	7.88	22.0
4/10/2009	0.6826	0.9641	8.89	8.89	20.0
5/10/2009	0.7695	1.2448	8.91	8.91	24.0
6/10/2009	0.6333	0.9996	6.91	6.91	24.0
7/10/2009	0.7306	0.9853	7.47	7.47	18.0
8/10/2009	0.7729	0.9972	7	7	30.0
9/10/2009	0.8911	1.232	6.9	6.9	32.0
10/10/2009	0.7373	1.0278	8.03	8.03	24.0
11/10/2009	0.7903	1.2586	7.38	7.38	24.0
12/10/2009	1.0573	1.6595	8.13	8.13	25.0
1/10/2010	0.446	0.8349	5.17	7.92	17.0
2/10/2010	0.5905	1.0039	8.62	8.62	21.0
3/10/2010	0.8122	1.017	7.19	7.19	18.0
4/10/2010	0.9139	1.4968	7.71	7.51	18.0
5/10/2010	1.1202	1.4185	7.19	7.19	22.0
6/10/2010	1.2402	1.7628	8.78	8.78	25.0
7/10/2010	1.2744	1.5996	8.28	8.28	28.0
8/10/2010	0.8617	1.6658	8.32	8.32	31.0
9/10/2010	0.503	0.8059	8.84	8.84	31.0
10/10/2010	0.5877	1.5809	8.78	8.78	27.0
11/10/2010	0.5127	0.947	8.49	8.49	17.0
12/10/2010	0.4231	0.6575	6.27	6.27	27.0
1/10/2011	0.4442	0.6729	8.29	8.29	23.0
2/10/2011	0.5584	0.79	8.05	8.05	11.0
3/10/2011	0.6516	1.0322	6.96	6.96	31.0
4/10/2011	0.7286	0.9582	7.78	7.78	31.0
5/10/2011	0.7513	1.1018	7.29	7.29	25.0
6/10/2011	1.4141	2.1027	7.26	7.26	25.0
7/10/2011	1.5199	1.8987	8.29	8.29	26.0
8/10/2011	1.8289	2.8215	7.04	7.04	30.0
9/10/2011	1.4729	2.1818	8.27	8.27	32.0
10/10/2011	1.5127	2.218	7.27	7.27	28.0
11/10/2011	1.4281	1.9042	8.13	8.13	23.0
12/10/2011	1.4217	1.7463	7.77	7.77	21.0
1/10/2012	1.276	1.5132	6.58	6.58	27.0
2/10/2012	0.7042	1.0952	8.28	8.28	23
Max.	1.83	2.82	**90%**	8.8	31
			10%	6.9	

James River Genco, LLC
VPDES Permit No. VA0073300
Outfall 101

DMR	Flow		Free Available Chlorine	
Due	Monthly Avg.	Maximum	Monthly Avg.	Maximum
Date	MGD	MGD	mg/L	mg/L
3/10/2009	0.0469	0.1391	<QL	<QL
4/10/2009	0.0605	0.1933	<QL	<QL
5/10/2009	0.144	0.4312	<QL	<QL
6/10/2009	0.0442	0.1308	<QL	<QL
7/10/2009	0.102	0.2313	<QL	<QL
8/10/2009	0.0654	0.1361	<QL	<QL
9/10/2009	0.0879	0.2256	<QL	<QL
10/10/2009	0.0437	0.1479	<QL	<QL
11/10/2009	0.06	0.1661	<QL	<QL
12/10/2009	0.1471	0.4015	<QL	<QL
1/10/2010	0.1209	0.4176	<QL	<QL
2/10/2010	0.0518	0.2104	<QL	<QL
3/10/2010	0.0332	0.1304	<QL	<QL
4/10/2010	0.021	0.113	<QL	<QL
5/10/2010	0.0341	0.0918	<QL	<QL
6/10/2010	0.0465	0.1282	<QL	<QL
7/10/2010	0.1024	0.2099	<QL	<QL
8/10/2010	0.1522	0.2311	<QL	<QL
9/10/2010	0.1537	0.3077	<QL	<QL
10/10/2010	0.1598	0.3416	<QL	<QL
11/10/2010	0.1074	0.2995	<QL	<QL
12/10/2010	0.0158	0.0477	<QL	<QL
1/10/2011	0.1173	0.3609	<QL	<QL
2/10/2011	0.1693	0.3348	<QL	<QL
3/10/2011	0.1081	0.2462	<QL	<QL
4/10/2011	0.0616	0.212	<QL	<QL
5/10/2011	0.0311	0.1121	<QL	<QL
6/10/2011	0.0408	0.1586	<QL	<QL
7/10/2011	0.1332	0.4759	0.10	0.10
8/10/2011	0.1549	0.4689	<QL	<QL
9/10/2011	0.1666	0.5335	<QL	<QL
10/10/2011	0.0903	0.3851	<QL	<QL
11/10/2011	0.0224	0.1247	<QL	<QL
12/10/2011	0.0513	0.1823	<QL	<QL
1/10/2012	0.018	0.1189	<QL	<QL
2/10/2012	0.0762	0.1782	0.15	0.15
Max.	0.169	0.534		

James River Genco, LLC
VPDES Permit No. VA0073300
Outfall 101

DMR Due Date	Total Recoverable Zinc			
	Monthly Avg. mg/L	Monthly Avg. kg/d	Maximum mg/L	Maximum kg/d
3/10/2009	0.119	<QL	0.119	0.0000
4/10/2009	0.070	0.002	0.070	0.002
5/10/2009	0.021	<QL	0.021	0.000
6/10/2009	0.030	<QL	0.030	0.000
7/10/2009	0.060	0.018	0.060	0.018
8/10/2009	0.025	<QL	0.025	<QL
9/10/2009	<QL	<QL	<QL	<QL
10/10/2009	0.092	<QL	0.092	0.000
11/10/2009	0.041	<QL	0.041	0.000
12/10/2009	0.025	<QL	0.025	0.000
1/10/2010	0.029	<QL	0.029	<QL
2/10/2010	<QL	<QL	<QL	<QL
3/10/2010	0.035	<QL	0.035	0.000
4/10/2010	0.059	0.005	0.059	0.005
5/10/2010	0.109	<QL	0.109	0.000
6/10/2010	0.081	0.004	0.081	0.004
7/10/2010	0.081	0.003	0.081	0.003
8/10/2010	0.044	<QL	0.044	0.000
9/10/2010	0.035	<QL	0.035	0.000
10/10/2010	0.042	<QL	0.042	0.000
11/10/2010	0.022	<QL	0.022	0.000
12/10/2010	0.088	<QL	0.088	0.000
1/10/2011	0.047	<QL	0.047	0.000
2/10/2011	0.033	<QL	0.033	<QL
3/10/2011	<QL	<QL	<QL	<QL
4/10/2011	0.050	<QL	0.050	<QL
5/10/2011	0.015	0.0003	0.015	0.0003
6/10/2011	0.043	<QL	0.043	0.0000
7/10/2011	0.045	<QL	0.045	0.0000
8/10/2011	0.056	0.0056	0.056	0.0056
9/10/2011	<QL	<QL	<QL	<QL
10/10/2011	<QL	<QL	<QL	<QL
11/10/2011	<QL	<QL	<QL	<QL
12/10/2011	<QL	<QL	<QL	<QL
1/10/2012	<QL	<QL	<QL	<QL
2/10/2012	<QL	<QL	<QL	<QL

James River Genco, LLC
VPDES Permit No. VA0073300
Outfall 101

DMR Due Date	Total Recoverable Chromium			
	Monthly Avg. mg/L	Monthly Avg. kg/d	Maximum mg/L	Maximum kg/d
3/10/2009	<QL	<QL	<QL	<QL
6/10/2009	<QL	<QL	<QL	<QL
9/10/2009	<QL	<QL	<QL	<QL
12/10/2009	<QL	<QL	<QL	<QL
3/10/2010	<QL	<QL	<QL	<QL
6/10/2010	<QL	<QL	<QL	<QL
9/10/2010	<QL	<QL	<QL	<QL
12/10/2010	<QL	<QL	<QL	<QL
3/10/2011	<QL	<QL	<QL	<QL
6/10/2011	<QL	<QL	<QL	<QL
9/10/2011	0.002	0.0008	0.002	0.0008
12/10/2011	<QL	<QL	<QL	<QL

James River Genco, LLC
VPDES Permit No. VA0073300
Outfall 102

DMR	Flow		Total Suspended Solids	
Due	Monthly Avg.	Maximum	Monthly Avg.	Maximum
Date	MGD	MGD	mg/L	mg/L
3/10/2009	0.6012	0.7996	20.0	20.0
4/10/2009	0.6435	0.829	28.0	28.0
5/10/2009	0.6303	0.9579	7.2	7.2
6/10/2009	0.6062	0.8688	14.0	14.0
7/10/2009	0.6354	0.8115	13.0	13.0
8/10/2009	0.7159	0.9617	12.0	12.0
9/10/2009	0.8032	1.0125	8.5	8.5
10/10/2009	0.7096	1.0278	17.0	17.0
11/10/2009	0.7496	1.0925	8.0	8.0
12/10/2009	0.92	1.4744	9.3	9.3
1/10/2010	0.3291	0.5936	12.0	12.0
2/10/2010	0.5437	0.7935	28.0	28.0
3/10/2010	0.7801	0.9622	11.0	11.0
4/10/2010	0.9031	1.4282	21.8	21.8
5/10/2010	1.1043	1.4028	52.0	52.0
6/10/2010	1.2027	1.7616	12.0	12.0
7/10/2010	1.172	1.4369	30.0	30.0
8/10/2010	0.7095	1.4861	6.6	6.6
9/10/2010	0.3494	0.5856	14.0	14.0
10/10/2010	0.4386	1.2955	11.0	11.0
11/10/2010	0.4261	0.919	7.8	7.8
12/10/2010	0.4152	0.6347	8.5	8.5
1/10/2011	0.3458	0.5686	1.9	1.9
2/10/2011	0.389	0.6498	14.0	14.0
3/10/2011	0.5975	0.9571	11.0	11.0
4/10/2011	0.6849	0.8392	0.0	0.0
5/10/2011	0.7306	1.0066	1.8	1.8
6/10/2011	1.3838	2.0129	12.0	12.0
7/10/2011	1.3867	1.8679	6.7	6.7
8/10/2011	1.6739	2.3859	20.0	20.0
9/10/2011	0	0	3.3	3.3
10/10/2011	1.4495	2.0598	53.8	53.8
11/10/2011	1.4144	1.7795	8.4	8.4
12/10/2011	1.3858	1.6478	9.3	9.3
1/10/2012	1.2644	1.5058	13.0	13.0
2/10/2012	0.6477	0.9448	21.0	21.0
Max.	1.67	2.39		

James River Genco, LLC
VPDES Permit No. VA0073300
Outfall 102

DMR Due Date	Oil & Grease Monthly Avg. mg/L	Oil & Grease Maximum mg/L
3/10/2009	<QL	<QL
4/10/2009	<QL	<QL
5/10/2009	<QL	<QL
6/10/2009	<QL	<QL
7/10/2009	<QL	<QL
8/10/2009	<QL	<QL
9/10/2009	<QL	<QL
10/10/2009	<QL	<QL
11/10/2009	<QL	<QL
12/10/2009	<QL	<QL
1/10/2010	<QL	<QL
2/10/2010	6.8	6.8
3/10/2010	<QL	<QL
4/10/2010	<QL	<QL
5/10/2010	<QL	<QL
6/10/2010	<QL	<QL
7/10/2010	<QL	<QL
8/10/2010	<QL	<QL
9/10/2010	<QL	<QL
10/10/2010	<QL	<QL
11/10/2010	<QL	<QL
12/10/2010	<QL	<QL
1/10/2011	<QL	<QL
2/10/2011	<QL	<QL
3/10/2011	<QL	<QL
4/10/2011	<QL	<QL
5/10/2011	<5	<5
6/10/2011	<5	<5
7/10/2011	<5	<5
8/10/2011	<5	<5
9/10/2011	<QL	<QL
10/10/2011	<QL	<QL
11/10/2011	<QL	<QL
12/10/2011	<QL	<QL
1/10/2012	<QL	<QL
2/10/2012	<QL	<QL

James River Genco, LLC
VPDES Permit No. VA0073300
Outfall 001
(WET Testing & Attachment A Monitoring)

Date	Hardness mg/L as $CaCO_3$
7/15/2009	268
8/26/2009	340
8/2/2010	330
6/29/2011	210
10/19/2011	168
11/16/2011	252
12/14/2011	156
Avg.	246

Attachment H

Water Quality Criteria Monitoring Summary

WATER QUALITY CRITERIA MONITORING SUMMARY

CHEMICAL	REQUIRED QUANTIFICATION LEVEL [1]	REPORTED RESULTS (µg/L)
METALS		
Antimony, dissolved	1.4	<0.5
Arsenic, dissolved	1.0	0.91
Cadmium, dissolved	0.3	<0.08
Chromium III, dissolved [3]	3.6	<3
Chromium VI, dissolved [3]	1.6	<3
Copper, dissolved	0.50	6.9
Lead, dissolved	0.50	<0.1
Mercury, dissolved	1.0	<5
Nickel, dissolved	0.94	4.1
Selenium, Total Recoverable	2.0	0.88
Silver, dissolved	0.20	<0.5
Thallium, dissolved	(2)	<5
Zinc, dissolved	3.6	3.0
PESTICIDES / PCB'S		
Aldrin	0.05	<0.05 [4]
Chlordane	0.2	<0.2 [4]
Chlorpyrifos (synonym = Dursban)	(2)	<0.2 [4]
DDD	0.1	<0.05 [4]
DDE	0.1	<0.05 [4]
DDT	0.1	<0.05 [4]
Demeton	(2)	<1 [4]
Diazinon	(2)	<1
Dieldrin	0.1	<0.05 [4]
Alpha-Endosulfan	0.1	<0.05

CHEMICAL	REQUIRED QUANTIFICATION LEVEL [1]	REPORTED RESULTS (µg/L)
Beta-Endosulfan	0.1	<0.05
Endosulfan Sulfate	0.1	<0.05 [4]
Endrin	0.1	<0.05 [4]
Endrin Aldehyde	(2)	<0.05 [4]
Guthion	(2)	<1 [4]
Heptachlor	0.05	<0.05 [4]
Heptachlor Epoxide	(2)	<0.05 [4]
Hexachlorocyclohexane Alpha-BHC	(2)	<5
Hexachlorocyclohexane Beta-BHC	(2)	<5
Hexachlorocyclohexane Gamma-BHC or Lindane	(2)	<5
Kepone	(2)	<5
Malathion	(2)	<1 [4]
Methoxychlor	(2)	<0.05 [4]
Mirex	(2)	<0.05 [4]
Parathion	(2)	<1 [4]
PCB Total	7.0	<5
Toxaphene	5.0	<0.05 [4]
BASE NEUTRAL EXTRACTABLES		
Acenaphthene	10.0	<5
Anthracene	10.0	<5
Benzidine	(2)	<5
Benzo (a) anthracene	10.0	<5
Benzo (b) fluoranthene	10.0	<5
Benzo (k) fluoranthene	10.0	<5
Benzo (a) pyrene	10.0	<5
Bis 2-Chloroethyl Ether	(2)	<5
Bis 2-Chloroisopropyl Ether	(2)	<5

CHEMICAL	REQUIRED QUANTIFICATION LEVEL [1]	REPORTED RESULTS (µg/L)
Butyl benzyl phthalate	10.0	<5
2-Chloronaphthalene	(2)	<5
Chrysene	10.0	<5
Dibenz(a,h)anthracene	20.0	<5
Dibutyl phthalate (synonym = Di-n-Butyl Phthalate)	10.0	<5
1,2-Dichlorobenzene	10.0	<5
1,3-Dichlorobenzene	10.0	<5
1,4-Dichlorobenzene	10.0	<5
3,3-Dichlorobenzidine	(2)	<5
Diethyl phthalate	10.0	<5
Bis-2-ethylhexyl phthalate	10.0	<5
Dimethyl phthalate	(2)	<5
2,4-Dinitrotoluene	10.0	<5
1,2-Diphenylhydrazine	(2)	<5
Fluoranthene	10.0	<5
Fluorene	10.0	<5
Hexachlorobenzene	(2)	<5
Hexachlorobutadiene	(2)	<5
Hexachlorocyclopentadiene	(2)	<5
Hexachloroethane	(2)	<5
Indeno(1,2,3-cd)pyrene	20.0	<5
Isophorone	10.0	<5
Nitrobenzene	10.0	<5
N-Nitrosodimethylamine	(2)	<5
N-Nitrosodi-n-propylamine	(2)	<5
N-Nitrosodiphenylamine	(2)	<5
Pyrene	10.0	<5

CHEMICAL	REQUIRED QUANTIFICATION LEVEL [1]	REPORTED RESULTS (µg/L)
1,2,4-Trichlorobenzene	10.0	<5
VOLATILES		
Acrolein	(2)	<50
Acrylonitrile	(2)	<50
Benzene	10.0	<5
Bromoform	10.0	<5
Carbon Tetrachloride	10.0	<5
Chlorobenzene (synonym = monochlorobenzene)	50.0	<5
Chlorodibromomethane	10.0	<5
Chloroform	10.0	100
Dichloromethane (synonym = methylene chloride)	20.0	<5
Dichlorobromomethane	10.0	18
1,2-Dichloroethane	10.0	<5
1,1-Dichloroethylene	10.0	<5
1,2-trans-dichloroethylene	(2)	<5
1,2-Dichloropropane	(2)	<5
1,3-Dichloropropene	(2)	<5
Ethylbenzene	10.0	<5
Methyl Bromide	(2)	<10
1,1,2,2-Tetrachloroethane	(2)	<5
Tetrachloroethylene	10.0	<5
Toluene	10.0	<5
1,1,2-Trichloroethane	(2)	<5
Trichloroethylene	10.0	<5
Vinyl Chloride	10.0	<10
ACID EXTRACTABLES		
2-Chlorophenol	10.0	<5

CHEMICAL	REQUIRED QUANTIFICATION LEVEL [1]	REPORTED RESULTS (µg/L)
2,4 Dichlorophenol	10.0	<5
2,4 Dimethylphenol	10.0	<5
2,4-Dinitrophenol	(2)	<20
2-Methyl-4,6-Dinitrophenol	(2)	<5
Nonylphenol	(2)	<5
Pentachlorophenol	50.0	<10
Phenol	10.0	<5
2,4,6-Trichlorophenol	10.0	<5
MISCELLANEOUS		
Ammonia as NH3-N	200	<100
Chlorides	(2)	58000
Chlorine, Total Residual	100	<100
Cyanide, Free	10.0	<5
E. coli (N/CML)	(2)	<1
Hydrogen Sulfide	(2)	400
Tributyltin [7]	(2)	<0.03
Hardness (mg/L as $CaCO_3$)	(2)	168

FOOTNOTES:

(1) Quantification level (QL) is defined as the lowest concentration used for the calibration of a measurement system when the calibration is in accordance with the procedures published for the required method.

The quantification levels indicated for the metals are actually Specific Target Values developed for this permit. The Specific Target Value is the approximate value that may initiate a wasteload allocation analysis. Target values are not wasteload allocations or effluent limitations. The Specific Target Values are subject to change based on additional information such as hardness data, receiving stream flow, and design flows.

Units for the quantification level are micrograms/liter unless otherwise specified.

(2) The QL is at the discretion of the permittee. For any substances addressed in 40 CFR Part 136, the permittee shall use one of the approved methods in 40 CFR Part 136.

(3) Both Chromium III and Chromium VI may be measured by the total chromium analysis. If the result of the total chromium analysis is less than or equal to the lesser of the Chromium III or Chromium VI method QL, the results for both Chromium III and Chromium VI can be reported as "<[QL]", where the actual analytical test QL is substituted for [QL].

(4) Monitoring data carried forward from the 2007 permit reissuance. The permittee indicated that “the testing results from the 2007 VPDES Permit Application are still believed to be representative of the facility’s effluent. The general operations and the raw materials utilized at the facility have not changed significantly and have been consistent since 2007.”

Attachment I

MSTRANTI & STATS Analyses

MSTRANTI DATA SOURCE REPORT

VA0073300 – James River Genco, LLC

Stream Information	
Mean Hardness	Calculated from data provided with Honeywell-Hopewell whole effluent toxicity testing reports (see Attachment E)
90% Temperature (annual)	Calculated from Honeywell-Hopewell EPA Form 2C application data (see Attachment E)
90% Temperature (wet season)	Not applicable, a winter effluent tier has not been included in the permit
90% Maximum pH	Calculated from Honeywell-Hopewell effluent data (see Attachment E)
10% Maximum pH	
Tier Designation	Flow frequency analysis memo (see Attachment A)
Stream Flows	
All Data	Calculated from Honeywell-Hopewell effluent data (see Attachment E)
Mixing Information	
All Data	MIX.exe analysis (see below)
Effluent Information	
Mean Hardness	Calculated from data provided with whole effluent toxicity testing reports and water quality criteria monitoring (see Attachment G)
90% Temperature (annual)	Calculated from data provided on monthly discharge monitoring reports (see Attachment G)
90% Temperature (wet season)	Not applicable, a winter effluent tier has not been included in the permit
90% Maximum pH	Calculated from data provided on monthly discharge monitoring reports (see Attachment G)
10% Maximum pH	
Discharge Flow	Maximum 30-day value reported on monthly discharge monitoring reports (see Attachment G)

Mixing Zone Predictions for James River Genco, LLC

Effluent Flow = 1.83 MGD
Stream 7Q10 = 63.89 MGD
Stream 30Q10 = 63.89 MGD
Stream 1Q10 = 63.89 MGD
Stream slope = 0.00054 ft/ft
Stream width = 56 ft
Bottom scale = 2
Channel scale = 1

The stream slope, stream width, bottom scale, and channel scale have been carried forward from the 2007 mixing zone analysis. In addition, the stream width was verified utilizing the most recent Virginia Environmental Geographic Inforamtion Systems (VEGIS) aerial photography.

Mixing Zone Predictions @ 7Q10

Depth = 2.4453 ft
Length = 1848.22 ft
Velocity = 0.7429 ft/sec
Residence Time = 0.0288 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 2.4453 ft
Length = 1848.22 ft
Velocity = 0.7429 ft/sec
Residence Time = 0.0288 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.4453 ft
Length = 1848.22 ft
Velocity = 0.7429 ft/sec
Residence Time = 0.6911 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: James River Genco, LLC Permit No.: VA0073300

Receiving Stream: Gravelly Run Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information			Stream Flows			Mixing Information			Effluent Information		
Mean Hardness (as CaCO3) =	67	mg/L	1Q10 (Annual) =	63.89	MGD	Annual - 1Q10 Mix =	100	%	Mean Hardness (as CaCO3) =	246	mg/L
90% Temperature (Annual) =	44	deg C	7Q10 (Annual) =	63.89	MGD	- 7Q10 Mix =	100	%	90% Temp (Annual) =	31	deg C
90% Temperature (Wet season) =	NA	deg C	30Q10 (Annual) =	63.89	MGD	- 30Q10 Mix =	100	%	90% Temp (Wet season) =	NA	deg C
90% Maximum pH =	8.9	SU	1Q10 (Wet season) =	63.89	MGD	Wet Season - 1Q10 Mix =	100	%	90% Maximum pH =	8.8	SU
10% Maximum pH =	7.7	SU	30Q10 (Wet season)	63.89	MGD	- 30Q10 Mix =	100	%	10% Maximum pH =	6.9	SU
Tier Designation (1 or 2) =	1		30Q5 =	63.89	MGD				Discharge Flow =	1.83	MGD
Public Water Supply (PWS) Y/N? =	N		Harmonic Mean =	63.89	MGD						
Trout Present Y/N? =	N										
Early Life Stages Present Y/N? =	Y										

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	na	9.9E+02	--	--	na	3.6E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.6E+04**
Acrolein	0	--	--	na	9.3E+00	--	--	na	3.3E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+02**
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	9.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.0E+01**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	1.1E+02	--	na	1.8E-02	--	--	--	--	--	--	--	--	**1.1E+02**	**--**	**na**	**1.8E-02**
Ammonia-N (mg/l) (Yearly)	0	1.56E+00	8.68E-02	na	--	5.62E+01	3.12E+00	na	--	--	--	--	--	--	--	--	--	**5.62E+01**	**3.12E+00**	**na**	**--**
Ammonia-N (mg/l) (High Flow)	0	1.56E+00	#VALUE!	na	--	5.62E+01	#VALUE!	na	--	--	--	--	--	--	--	--	--	**5.62E+01**	**#VALUE!**	**na**	**--**
Anthracene	0	--	--	na	4.0E+04	--	--	na	1.4E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+06**
Antimony	0	--	--	na	6.4E+02	--	--	na	2.3E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.3E+04**
Arsenic	0	3.4E+02	1.5E+02	na	--	1.2E+04	5.4E+03	na	--	--	--	--	--	--	--	--	--	**1.2E+04**	**5.4E+03**	**na**	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E+04**
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	7.2E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.2E-02**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.9E+02**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	2.3E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.3E+06**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	7.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.9E+02**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	5.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.0E+04**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	6.8E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.8E+04**
Cadmium	0	2.7E+00	8.8E-01	na	--	9.7E+01	3.1E+01	na	--	--	--	--	--	--	--	--	--	**9.7E+01**	**3.1E+01**	**na**	**--**
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	5.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+02**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	8.6E+01	1.5E-01	na	2.9E-01	--	--	--	--	--	--	--	--	**8.6E+01**	**1.5E-01**	**na**	**2.9E-01**
Chloride	0	8.6E+05	2.3E+05	na	--	3.1E+07	8.3E+06	na	--	--	--	--	--	--	--	--	--	**3.1E+07**	**8.3E+06**	**na**	**--**
TRC	0	1.9E+01	1.1E+01	na	--	6.8E+02	4.0E+02	na	--	--	--	--	--	--	--	--	--	**6.8E+02**	**4.0E+02**	**na**	**--**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	5.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+04**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	4.7E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+03**
Chloroform	0	--	--	na	1.1E+04	--	--	na	4.0E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+05**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	5.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+04**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	5.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.4E+03**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	3.0E+00	1.5E+00	na	--	--	--	--	--	--	--	--	--	**3.0E+00**	**1.5E+00**	**na**	**--**
Chromium III	0	4.4E+02	5.7E+01	na	--	1.6E+04	2.0E+03	na	--	--	--	--	--	--	--	--	--	**1.6E+04**	**2.0E+03**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	5.7E+02	4.0E+02	na	--	--	--	--	--	--	--	--	--	**5.7E+02**	**4.0E+02**	**na**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	6.5E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E-01**
Copper	0	9.9E+00	6.8E+00	na	--	3.5E+02	2.4E+02	na	--	--	--	--	--	--	--	--	--	**3.5E+02**	**2.4E+02**	**na**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	7.9E+02	1.9E+02	na	5.7E+05	--	--	--	--	--	--	--	--	**7.9E+02**	**1.9E+02**	**na**	**5.7E+05**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	1.1E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E-01**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	7.9E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.9E-02**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	4.0E+01	3.6E-02	na	7.9E-02	--	--	--	--	--	--	--	--	**4.0E+01**	**3.6E-02**	**na**	**7.9E-02**
Demeton	0	--	1.0E-01	na	--	--	3.6E+00	na	--	--	--	--	--	--	--	--	--	**--**	**3.6E+00**	**na**	**--**
Diazinon	0	1.7E-01	1.7E-01	na	--	6.1E+00	6.1E+00	na	--	--	--	--	--	--	--	--	--	**6.1E+00**	**6.1E+00**	**na**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	4.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+04**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	3.4E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.4E+04**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	6.8E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.8E+03**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	1.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+01**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	6.1E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+03**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	1.3E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+04**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	2.5E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.5E+05**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	3.6E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.6E+05**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+04**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	5.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.4E+03**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	7.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.5E+03**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	8.6E+00	2.0E+00	na	1.9E-02	--	--	--	--	--	--	--	--	**8.6E+00**	**2.0E+00**	**na**	**1.9E-02**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	1.6E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+06**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	3.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.1E+04**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	4.0E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+07**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	1.6E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+05**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	1.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.9E+05**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+04**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+03**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	1.8E-06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E-06**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	7.2E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.2E+01**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	7.9E+00	2.0E+00	na	3.2E+03	--	--	--	--	--	--	--	--	**7.9E+00**	**2.0E+00**	**na**	**3.2E+03**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	7.9E+00	2.0E+00	na	3.2E+03	--	--	--	--	--	--	--	--	**7.9E+00**	**2.0E+00**	**na**	**3.2E+03**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	7.9E+00	2.0E+00	--	--	--	--	--	--	--	--	--	--	**7.9E+00**	**2.0E+00**	**--**	**--**
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	3.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.2E+03**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	3.1E+00	1.3E+00	na	2.2E+00	--	--	--	--	--	--	--	--	**3.1E+00**	**1.3E+00**	**na**	**2.2E+00**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	1.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	7.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.5E+04**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	5.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.0E+03**
Fluorene	0	--	--	na	5.3E+03	--	--	na	1.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.9E+05**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Guthion	0	--	1.0E-02	na	--	--	3.6E-01	na	--	--	--	--	--	--	--	--	--	**--**	**3.6E-01**	**na**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	1.9E+01	1.4E-01	na	2.8E-02	--	--	--	--	--	--	--	--	**1.9E+01**	**1.4E-01**	**na**	**2.8E-02**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	1.9E+01	1.4E-01	na	1.4E-02	--	--	--	--	--	--	--	--	**1.9E+01**	**1.4E-01**	**na**	**1.4E-02**
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	1.0E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E-01**
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	6.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+03**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	1.8E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E+00**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	6.1E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+00**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	3.4E+01	--	na	6.5E+01	--	--	--	--	--	--	--	--	**3.4E+01**	**--**	**na**	**6.5E+01**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+04**
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+03**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	7.2E+01	na	--	--	--	--	--	--	--	--	--	**--**	**7.2E+01**	**na**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	3.4E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.4E+05**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**na**	**--**
Lead	0	7.8E+01	8.9E+00	na	--	2.8E+03	3.2E+02	na	--	--	--	--	--	--	--	--	--	**2.8E+03**	**3.2E+02**	**na**	**--**
Malathion	0	--	1.0E-01	na	--	--	3.6E+00	na	--	--	--	--	--	--	--	--	--	**--**	**3.6E+00**	**na**	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	5.0E+01	2.8E+01	- -	- -	--	--	--	--	--	--	--	--	**5.0E+01**	**2.8E+01**	**- -**	**- -**
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	5.4E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.4E+04**
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	2.1E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E+05**
Methoxychlor	0	--	3.0E-02	na	--	--	1.1E+00	na	--	--	--	--	--	--	--	--	--	**--**	**1.1E+00**	**na**	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**na**	**--**
Nickel	0	1.4E+02	1.5E+01	na	4.6E+03	5.0E+03	5.5E+02	na	1.7E+05	--	--	--	--	--	--	--	--	**5.0E+03**	**5.5E+02**	**na**	**1.7E+05**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	2.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.5E+04**
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+03**
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	2.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.2E+03**
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E+02**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.0E+03	2.4E+02	na	--	--	--	--	--	--	--	--	--	**1.0E+03**	**2.4E+02**	**na**	**--**
Parathion	0	6.5E-02	1.3E-02	na	--	2.3E+00	4.7E-01	na	--	--	--	--	--	--	--	--	--	**2.3E+00**	**4.7E-01**	**na**	**--**
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	5.0E-01	na	2.3E-02	--	--	--	--	--	--	--	--	**--**	**5.0E-01**	**na**	**2.3E-02**
Pentachlorophenol [C]	0	1.7E+01	1.3E+01	na	3.0E+01	6.0E+02	4.6E+02	na	1.1E+03	--	--	--	--	--	--	--	--	**6.0E+02**	**4.6E+02**	**na**	**1.1E+03**
Phenol	0	--	--	na	8.6E+05	--	--	na	3.1E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.1E+07**
Pyrene	0	--	--	na	4.0E+03	--	--	na	1.4E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+05**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	7.2E+02	1.8E+02	na	1.5E+05	--	--	--	--	--	--	--	--	**7.2E+02**	**1.8E+02**	**na**	**1.5E+05**
Silver	0	2.0E+00	--	na	--	7.0E+01	--	na	--	--	--	--	--	--	--	--	--	**7.0E+01**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+03**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+03**
Thallium	0	--	--	na	4.7E-01	--	--	na	1.7E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+01**
Toluene	0	--	--	na	6.0E+03	--	--	na	2.2E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.2E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	2.6E+01	7.2E-03	na	1.0E-01	--	--	--	--	--	--	--	--	**2.6E+01**	**7.2E-03**	**na**	**1.0E-01**
Tributyltin	0	4.6E-01	7.2E-02	na	--	1.7E+01	2.6E+00	na	--	--	--	--	--	--	--	--	--	**1.7E+01**	**2.6E+00**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	2.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.5E+03**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	5.7E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+03**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+04**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	8.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.6E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	8.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.6E+02**
Zinc	0	8.9E+01	8.9E+01	na	2.6E+04	3.2E+03	3.2E+03	na	9.3E+05	--	--	--	--	--	--	--	--	**3.2E+03**	**3.2E+03**	**na**	**9.3E+05**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	2.3E+04
Arsenic	3.2E+03
Barium	na
Cadmium	1.9E+01
Chromium III	1.2E+03
Chromium VI	2.3E+02
Copper	1.4E+02
Iron	na
Lead	1.9E+02
Manganese	na
Mercury	1.7E+01
Nickel	3.3E+02
Selenium	1.1E+02
Silver	2.8E+01
Zinc	1.3E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

3/22/2012 1:45:26 PM

Facility = James River Genco, LLC
Chemical = Dissolved Arsenic
Chronic averaging period = 4
WLAa = 12000 ug/L
WLAc = 5400 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 0.91
Variance = 0.298116
C.V. = 0.6
97th percentile daily values = 2.21440 ug/L
97th percentile 4 day average = 1.51404 ug/L
97th percentile 30 day average= 1.09750 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.91 ug/L

3/22/2012 2:07:42 PM

Facility = James River Genco, LLC
Chemical = Chloride
Chronic averaging period = 4
WLAa = 31000000 ug/L
WLAc = 8300000 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 58000
Variance = 1211040
C.V. = 0.6
97th percentile daily values = 141138.0 ug/L
97th percentile 4 day average = 96499.8 ug/L
97th percentile 30 day average= 69951.0 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

58000 ug/L

3/22/2012 1:44:28 PM

Facility = James River Genco, LLC
Chemical = Dissolved Chromium VI
Chronic averaging period = 4
WLAa = 570 ug/L
WLAc = 400 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025 ug/L
97th percentile 4 day average = 4.99137 ug/L
97th percentile 30 day average= 3.61815 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3 ug/L

3/22/2012 1:46:35 PM

Facility = James River Genco, LLC
Chemical = Dissolved Copper
Chronic averaging period = 4
WLAa = 350 ug/L
WLAc = 240 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 6.9
Variance = 17.1396
C.V. = 0.6
97th percentile daily values = 16.7905 ug/L
97th percentile 4 day average = 11.4801 ug/L
97th percentile 30 day average= 8.32176 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

6.9 ug/L

3/22/2012 2:08:42 PM

Facility = James River Genco, LLC
Chemical = Hydrogen Sulfide
Chronic averaging period = 4
WLAa = N/A
WLAc = 72 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 400
Variance = 57600
C.V. = 0.6
97th percentile daily values = 973.367 ug/L
97th percentile 4 day average = 665.516 ug/L
97th percentile 30 day average= 482.421 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 105.305384451833 ug/L
Average Weekly limit = 105.305384451833 ug/L
Average Monthly LImit = 105.305384451833 ug/L

The data are:

400 ug/L

Monitoring and reporting for dissolved sulfide has been included in the 2012 permit in lieu of hydrogen sulfide effluent limitations.

3/22/2012 1:59:38 PM

Facility = James River Genco, LLC
Chemical = Dissolved Mercury
Chronic averaging period = 4
WLAa = 50 ug/L
WLAc = 28 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 5
Variance = 9
C.V. = 0.6
97th percentile daily values = 12.1670 ug/L
97th percentile 4 day average = 8.31895 ug/L
97th percentile 30 day average= 6.03026 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5 ug/L

3/22/2012 1:59:09 PM

Facility = James River Genco, LLC
Chemical = Dissolved Nickel
Chronic averaging period = 4
WLAa = 5000 ug/L
WLAc = 550 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 4.1
Variance = 6.0516
C.V. = 0.6
97th percentile daily values = 9.97701 ug/L
97th percentile 4 day average = 6.82153 ug/L
97th percentile 30 day average= 4.94481 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

4.1 ug/L

3/22/2012 2:03:27 PM

Facility = James River Genco, LLC
Chemical = Total Recoverable Selenium
Chronic averaging period = 4
WLAa = 720 ug/L
WLAc = 180 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 0.5
Variance = 0.09
C.V. = 0.6
97th percentile daily values = 1.21670 ug/L
97th percentile 4 day average = .831895 ug/L
97th percentile 30 day average= .603026 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.5 ug/L

3/22/2012 2:02:46 PM

Facility = James River Genco, LLC
Chemical = Dissolved Silver
Chronic averaging period = 4
WLAa = 70 ug/L
WLAc = N/A
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 0.5
Variance = 0.09
C.V. = 0.6
97th percentile daily values = 1.21670 ug/L
97th percentile 4 day average = .831895 ug/L
97th percentile 30 day average= .603026 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.5 ug/L

3/22/2012 2:04:08 PM

Facility = James River Genco, LLC
Chemical = Dissolved Zinc
Chronic averaging period = 4
WLAa = 3200 ug/L
WLAc = 3200 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 3
Variance = 3.24
C.V. = 0.6
97th percentile daily values = 7.30025 ug/L
97th percentile 4 day average = 4.99137 ug/L
97th percentile 30 day average= 3.61815 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3 ug/L

Attachment J

40 CFR 423 – Federal Effluent Guidelines for Steam Electric Power Generating Point Sources

section, which may be discharged by a point source subject to the provisions of this subpart after application of the standards of performance for new sources:

[Metric units (kg/kkg of product); English units (lb/1,000 lb of product)]

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
TSS	0.35	0.18
Total phosphorus (as P)	.56	.28
Fluoride (as F)	.21	.11
pH	(1)	(1)

1 Within the range 6.0 to 9.5.

§ 422.66 [Reserved]

§ 422.67 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

[Metric units (kg/kkg of product); English units (lb/1,000 lb of product)]

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
TSS	0.35	0.18
pH	(1)	(1)

1 Within the range 6.0 to 9.5.

[51 FR 25000, July 9, 1986]

PART 423—STEAM ELECTRIC POWER GENERATING POINT SOURCE CATEGORY

Sec.

AUTHORITY: Secs. 301; 304(b), (c), (e), and (g); 306(b) and (c); 307(b) and (c); and 501, Clean Water Act (Federal Water Pollution Control Act Amendments of 1972, as amended by Clean Water Act of 1977) (the ''Act''; 33 U.S.C. 1311; 1314(b), (c), (e), and (g); 1316(b) and (c); 1317(b) and (c); and 1361; 86 Stat. 816, Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217), unless otherwise noted.

SOURCE: 47 FR 52304, Nov. 19, 1982, unless otherwise noted.

§ 423.10 Applicability.

The provisions of this part are applicable to discharges resulting from the operation of a generating unit by an establishment primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium.

§ 423.11 Specialized definitions.

In addition to the definitions set forth in 40 CFR part 401, the following definitions apply to this part:

(a) The term *total residual chlorine* (or total residual oxidants for intake water with bromides) means the value obtained using the amperometric method for total residual chlorine described in 40 CFR part 136.

(b) The term *low volume waste sources* means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations are otherwise established in this part. Low volume wastes sources include, but are not limited to:

wastewaters from wet scrubber air pollution control systems, ion exchange water treatment system, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, and recirculating house service water systems. Sanitary and air conditioning wastes are not included.

(c) The term *chemical metal cleaning waste* means any wastewater resulting from the cleaning of any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning.

(d) The term *metal cleaning waste* means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

(e) The term *fly ash* means the ash that is carried out of the furnace by the gas stream and collected by mechanical precipitators, electrostatic precipitators, and/or fabric filters. Economizer ash is included when it is collected with fly ash.

(f) The term *bottom ash* means the ash that drops out of the furnace gas stream in the furnace and in the economizer sections. Economizer ash is included when it is collected with bottom ash.

(g) The term *once through cooling water* means water passed through the main cooling condensers in one or two passes for the purpose of removing waste heat.

(h) The term *recirculated cooling water* means water which is passed through the main condensers for the purpose of removing waste heat, passed through a cooling device for the purpose of removing such heat from the water and then passed again, except for blowdown, through the main condenser.

(i) The term *10 year, 24/hour rainfall event* means a rainfall event with a probable recurrence interval of once in ten years as defined by the National Weather Service in Technical Paper No. 40. *Rainfall Frequency Atlas of the United States,* May 1961 or equivalent regional rainfall probability information developed therefrom.

(j) The term *blowdown* means the minimum discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentration in amounts exceeding limits established by best engineering practices.

(k) The term *average concentration* as it relates to chlorine discharge means the average of analyses made over a single period of chlorine release which does not exceed two hours.

(l) The term *free available chlorine* shall mean the value obtained using the amperometric titration method for free available chlorine described in *Standard Methods for the Examination of Water and Wastewater,* page 112 (13th edition).

(m) The term *coal pile runoff* means the rainfall runoff from or through any coal storage pile.

§ 423.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) In establishing the limitations set forth in this section, EPA took into account all information it was able to collect, develop and solicit with respect to factors (such as age and size of plant, utilization of facilities, raw materials, manufacturing processes, nonwater quality environmental impacts, control and treatment technology available, energy requirements and costs) which can affect the industry subcategorization and effluent levels established. It is, however, possible that data which would affect these limitations have not been available and, as a result, these limitations should be adjusted for certain plants in this industry. An individual discharger or other interested person may submit evidence to the Regional Administrator (or to the State, if the State has the authority to issue NPDES permits) that factors relating to the equipment or facilities involved, the process applied, or other such factors related to such discharger are fundamentally different from the factors considered in the establishment of the guidelines. On the basis of such evidence or other available information, the Regional

Administrator (or the State) will make a written finding that such factors are or are not fundamentally different for that facility compared to those specified in the Development Document. If such fundamentally different factors are found to exist, the Regional Administrator or the State shall establish for the discharger effluent limitations in the NPDES Permit either more or less stringent than the limitations established herein, to the extent dictated by such fundamentally different factors. Such limitations must be approved by the Administrator of the Environmental Protection Agency. The Administrator may approve or disapprove such limitations, specify other limitations, or initiate proceedings to revise these regulations. The phrase ''other such factors'' appearing above may include significant cost differentials. In no event may a discharger's impact on receiving water quality be considered as a factor under this paragraph.

(b) Any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction by the application of the best practicable control technology currently available (BPT):

(1) The pH of all discharges, except once through cooling water, shall be within the range of 6.0–9.0.

(2) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(3) The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the concentration lised in the following table:

Pollutant or pollutant property	BPT effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0

(4) The quantity of pollutants discharged in fly ash and bottom ash transport water shall not exceed the quantity determined by multiplying the flow of fly ash and bottom ash transport water times the concentration listed in the following table:

Pollutant or pollutant property	BPT effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0

(5) The quantity of pollutants discharged in metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of metal cleaning wastes times the concentration listed in the following table:

Pollutant or pollutant property	BPT effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0
Copper, total	1.0	1.0
Iron, total	1.0	1.0

(6) The quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentation listed in the following table:

Pollutant or pollutant property	BPT effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine	0.5	0.2

(7) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown sources times the concentration listed in the following table:

Pollutant or pollutant property	BPT effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine	0.5	0.2

(8) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level or chlorination.

(9) Subject to the provisions of paragraph (b)(10) of this section, the following effluent limitations shall apply to the point source discharges of coal pile runoff:

Pollutant or pollutant property	BPT effluent limitations
	Maximum concentration for any time (mg/l)
TSS	50

(10) Any untreated overflow from facilities designed, constructed, and operated to treat the volume of coal pile runoff which is associated with a 10 year, 24 hour rainfall event shall not be subject to the limitations in paragraph (b)(9) of this section.

(11) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitations specified in paragraphs (b)(3) through (7) of this section. Concentration limitations shall be those concentrations specified in this section.

(12) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (11) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

(The information collection requirements contained in paragraph (a) were approved by the Office of Management and Budget under control number 2000–0194)

[47 FR 52304, Nov. 19, 1982, as amended at 48 FR 31404, July 8, 1983]

§ 423.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this part must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(b)(1) For any plant with a total rated electric generating capacity of 25 or more megawatts, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water from each discharge point times the concentration listed in the following table:

Pollutant or pollutant property	BAT Effluent Limitations
	Maximum concentration (mg/l)
Total residual chlorine	0.20

(2) Total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.

(c)(1) For any plant with a total rated generating capacity of less than 25 megawatts, the quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:

Pollutant or pollutant property	BAT effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine	0.5	0.2

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(d)(1) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the concentration listed below:

Pollutant or pollutant property	BAT effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine	0.5	0.2

Pollutant or pollutant property	Maximum for any 1 day – (mg/l)	Average of daily values for 30 consecutive days shall not exceed =(mg/l)
The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except:	[1]	[1]
Chromium, total	0.2	0.2
Zinc, total	1.0	1.0

[1] No detectable amount.

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(3) At the permitting authority's discretion, instead of the monitoring specified in 40 CFR 122.11(b) compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

(e) The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentration listed in the following table:

Pollutant or pollutant property	BAT effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed – (mg/l)
Copper, total	1.0	1.0
Iron, total	1.0	1.0

(f) [Reserved—Nonchemical Metal Cleaning Wastes].

(g) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitations specified in paragraphs (b) through (e) of this section. Concentration limitations shall be those concentrations specified in this section.

(h) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (g) of this section attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

(The information collection requirements contained in paragraphs (c)(2) and (d)(2) were approved by the Office of Management and Budget under control number 2040–0040. The information collection requirements contained in paragraph (d)(3) were approved under control number 2040–0033.)

[47 FR 52304, Nov. 19, 1982, as amended at 48 FR 31404, July 8, 1983]

§ 423.14 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 423.15 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards:

(a) The pH of all discharges, except once through cooling water, shall be within the range of 6.0–9.0.

(b) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(c) The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the concentration listed in the following table:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0

(d) The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentration listed in the following table:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0
Copper, total	1.0	1.0
Iron, total	1.0	1.0

(e) [Reserved—Nonchemical Metal Cleaning Wastes].

(f) The quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of the bottom ash transport water times the concentration listed in the following table:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0

(g) There shall be no discharge of wastewater pollutants from fly ash transport water.

(h)(1) For any plant with a total rated electric generating capacity of 25 or more megawatts, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water from each discharge point times the concentration listed in the following table:

Pollutant or pollutant property	NSPS effluent limitations
	Maximum concentration (mg/l)
Total residual chlorine	0.20

(2) Total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.

(i)(1) For any plant with a total rated generating capacity of less than 25 megawatts, the quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:

Pollutant of pollutant property	NSPS effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine	0.5	0.2

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(j)(1) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the concentration listed below:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine	0.5	0.2

Pollutant or pollutant property	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed – (mg/l)
The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except:	[1]	[1]
Chromium, total	0.2	0.2
Zinc, total	1.0	1.0

[1] No detectable amount.

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(3) At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (j)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

(k) Subject to the provisions of § 423.15(l), the quantity or quality of pollutants or pollutant parameters discharged in coal pile runoff shall not exceed the limitations specified below:

Pollutant or pollutant property	NSPS effluent limitations for any time
TSS	Not to exceed 50 mg/l.

(l) Any untreated overflow from facilities designed, constructed, and operated to treat the coal pile runoff which results from a 10 year, 24 hour rainfall event shall not be subject to the limitations in § 423.15(k).

(m) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitation specified in paragraphs (c) through (j) of this section. Concentration limits shall be based on the concentrations specified in this section.

(n) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (m) of this section attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

(The information collection requirements contained in paragraphs (h)(2), (i)(2), and (j)(2) were approved by the Office of Management and Budget under control number 2040–0040. The information collection requirements contained in paragraph (j)(3) were approved under control number 2040–0033.)

[47 FR 52304, Nov. 19, 1982, as amended at 48 FR 31404, July 8, 1983]

§ 423.16 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for existing sources (PSES) by July 1, 1984:

(a) There shall be no discharge of polychlorinated biphenol compounds such as those used for transformer fluid.

(b) The pollutants discharged in chemical metal cleaning wastes shall not exceed the concentration listed in the following table:

Pollutant or pollutant property	PSES pretreatment standards
	Maximum for 1 day (mg/l)
Copper, total	1.0

(c) [Reserved—Nonchemical Metal Cleaning Wastes].

(d)(1) The pollutants discharged in cooling tower blowdown shall not exceed the concentration listed in the following table:

Pollutant or pollutant property	PSES pretreatment standards
	Maximum for any time (mg/l)
The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except:	
Chromium, total	0.2
Zinc, total	1.0

[1] No detectable amount.

(2) At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

§ 423.17 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart part which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and the following pretreatment standards for new sources (PSNS).

(a) There shall be no discharge of polychlorinated biphenyl compounds such as those used for transformer fluid.

(b) The pollutants discharged in chemical metal cleaning wastes shall not exceed the concentration listed in the following table:

Pollutant or pollutant property	PSNS pretreatment standards
	Maximum for 1 day (mg/l)
Copper, total	1.0

(c) [Reserved—Nonchemical Metal Cleaning Wastes].

(d)(1) The pollutants discharged in cooling tower blowdown shall not exceed the concentration listed in the following table:

Pollutant or pollutant property	PSNS pretreatment standards
	Maximum for any time (mg/l)
The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except:	
Chromium, total	0.2
Zinc, total	1.0

(2) At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

(e) There shall be no discharge of wastewater pollutants from fly ash transport water.

Appendix A to Part 423—126 Priority Pollutants

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
011 1,1,1-trichloreothane
012 Hexachloroethane
013 1,1-dichloroethane
014 1,1,2-trichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
018 Bis(2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
021 2,4, 6-trichlorophenol
022 Parachlorometa cresol
023 Chloroform (trichloromethane)

024 2-chlorophenol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2-trans-dichloroethylene
031 2,4-dichlorophenol
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
038 Ethylbenzene
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
044 Methylene chloride (dichloromethane)
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
048 Dichlorobromomethane
051 Chlorodibromomethane
052 Hexachlorobutadiene
053 Hexachloromyclopentadiene
054 Isophorone
055 Naphthalene
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamin
064 Pentachlorophenol
065 Phenol
066 Bis(2-ethylhexyl) phthalate
067 Butyl benzyl phthalate
068 Di-N-Butyl Phthalate
069 Di-n-octyl phthalate
070 Diethyl Phthalate
071 Dimethyl phthalate
072 1,2-benzanthracene (benzo(a) anthracene
073 Benzo(a)pyrene (3,4-benzo-pyrene)
074 3,4-Benzofluoranthene (benzo(b) fluoranthene)
075 11,12-benzofluoranthene (benzo(b) fluoranthene)
076 Chrysene
077 Acenaphthylene
078 Anthracene
079 1,12-benzoperylene (benzo(ghi) perylene)
080 Fluorene
081 Phenanthrene
082 1,2,5,6-dibenzanthracene (dibenzo(,h) anthracene)
083 Indeno (,1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
084 Pyrene
085 Tetrachloroethylene
086 Toluene
087 Trichloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB–1242 (Arochlor 1242)
107 PCB–1254 (Arochlor 1254)
108 PCB–1221 (Arochlor 1221)
109 PCB–1232 (Arochlor 1232)
110 PCB–1248 (Arochlor 1248)
111 PCB–1260 (Arochlor 1260)
112 PCB–1016 (Arochlor 1016)
113 Toxaphene
114 Antimony
115 Arsenic
116 Asbestos
117 Beryllium
118 Cadmium
119 Chromium
120 Copper
121 Cyanide, Total
122 Lead
123 Mercury
124 Nickel
125 Selenium
126 Silver
127 Thallium
126 Silver
128 Zinc
129 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

PART 424—FERROALLOY MANUFACTURING POINT SOURCE CATEGORY

Subpart A—Open Electric Furnaces With Wet Air Pollution Control Devices Subcategory

Sec.

Attachment K

Whole Effluent Toxicity (WET) Memo

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949–A Cox Road **Glen Allen, Virginia 23060** **(804) 527-5020**

TO: Deborah DeBiasi, Whole Effluent Toxicity (WET) Program, OWP&CA

FROM: Drew Hammond, Water Permit Writer, PRO

DATE: March 5, 2012

SUBJECT: VPDES Permit No. VA0073300
James River Cogeneration Company (James River Genco, LLC)
WET Testing Data Review

COPIES: File

Facility Name: James River Cogeneration Company (James River Genco, LLC)

Permit Number: VA0073300

Receiving Stream: Gravelly Run (Outfall 001)

Facility SIC: 4911 (Electric Services)
4961 (Steam and Air-Conditioning Supply)
4931 (Electric and Other Services Combined)

Acute In-Stream Waste Concentration (IWC_{acute}): 2.8%

Background

The 2007 Virginia Pollutant Discharge Elimination System (VPDES) permit for James River Cogeneration Company (James River Genco, LLC) is in the process of reissuance. The 2007 permit authorized the discharge of treated industrial wastewaters from Outfall 001 into Gravelly Run in the City of Hopewell, Virginia. The existing VPDES permit expires on October 10, 2012.

This facility was originally included in the Toxics Management Program (TMP) with the 1992 permit reissuance. The 1992 permit required annual acute toxicity testing for Outfall 001 using *Daphia pulex*. The acute endpoint was an LC_{50} equal to 100%. Chronic toxicity testing was not included in the 1992 permit since the chronic in-stream waste concentration ($IWC_{chronic}$) was less than 1%. When the permit was reissued in 1997 the test species was changed to *Ceriodaphina dubia*; however, the acute endpoint remained the same. In addition, chronic toxicity testing was not included in the 1997 permit. The 1997 annual acute toxicity testing requirements were carried forward with the 2002 permit reissuance with no changes.

Permit Requirements

The expiring 2007 VPDES permit contains Whole Effluent Toxicity (WET) testing for Outfall 001. More specifically, the WET testing special condition requires annual acute toxicity testing for Outfall 001

utilizing *Ceriodaphina dubia and Pimephales promelas*. The 2007 special condition set the acute endpoint of NOAEC equal to 100% (TU_a of 1.00).

Data Summary

This data review includes the results of the annual acute toxicity testing for Outfall 001. All WET testing was performed by James R. Reed & Associates (JRRA) and no quality control problems were found.

Table 1. Results of the Acute WET Tests for *Ceriodaphina dubia*

Test Date	NOAEC	% Survival in 100% Effluent	Laboratory
8/1/2008	100	100	JRRA
7/16/2009	12.5	50	JRRA
8/27/2009	100	100	JRRA
8/4/2010	100	95	JRRA
7/1/2011	100	100	JRRA
11/18/2011	50	75	JRRA
12/15/2011	100	100	JRRA

Table 2. Results of the Acute WET Tests for *Pimephales promelas*

Test Date	NOAEC	% Survival in 100% Effluent	Laboratory
8/1/2008	100	100	JRRA
7/16/2009	100	100	JRRA
8/4/2010	100	100	JRRA
7/1/2011	100	100	JRRA
11/18/2011	100	100	JRRA

Conclusions & Recommendations

The 2007 permit required the permittee to perform annual acute WET testing for Outfall 001 using *Pimephales promelas*. Since 100% of the acute WET testing results met the special condition endpoint of NOAEC equal to 100%, DEQ staff recommends discontinuing the required acute WET testing with the 2012 permit reissuance. The 2007 permit also required the permittee to perform annual acute WET testing for Outfall 001 using *Ceriodaphina dubia.* Since 71% of the acute WET testing results met the special condition endpoint of NOAEC equal to 100%, DEQ staff recommends continued acute WET testing with the 2012 permit reissuance. However, the 2012 acute endpoint has been revised to an LC_{50} of 20% (which is equivalent to 5.00 acute toxic units) in accordance with current agency guidance (WETLIM10, see attached). Annual acute WET testing using *Ceriodaphina dubia* will allow DEQ staff to further evaluate the effluent's potential toxic effect on aquatic life utilizing the most sensitive species.

The revised WET testing permit section to be included in the 2012 permit reissuance is as follows:

C. Whole Effluent Toxicity (WET) Testing

1. In accordance with the Part I.C.5 schedule below, the permittee shall perform toxicity testing on Outfall 001 using 24-hour flow-proportioned composite samples for the duration of the permit. The acute test to use is:

   48 Hour Static Acute Test with *Ceriodaphnia dubia*

   These acute tests shall be performed with a minimum of 5 dilutions, derived geometrically, for calculation of a valid LC_{50}. Express the results as TU_a (Acute Toxic Units) by dividing $100/LC_{50}$ for reporting.

The test dilutions should be able to determine compliance with the following endpoint:

Acute LC_{50} of 20% equivalent to a TU_a of 5.00

2. The permittee may provide additional samples to address data variability. These data shall be reported and may be included in the evaluation of effluent toxicity. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.

3. The test data will be evaluated statistically by DEQ for reasonable potential at the conclusion of the permit term. The data may be evaluated sooner if requested by the permittee, or if toxicity has been noted. Should DEQ evaluation of the data indicate that a limit is needed, the permit may be modified or, alternatively revoked and reissued to include a WET limitation and compliance schedule. Following written notification from DEQ of the need for including a WET limitation, the toxicity tests of Part I.C.1 may be discontinued.

4. The permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters. The pollutant specific limits must control the toxicity of the effluent.

5. The permittee shall submit one (1) copy of each toxicity test report in accordance with the following schedule:

Test Period	Test Period Dates	Submit Test Report No Later Than
Year 1	Jan 1 – Dec 31, 20XX	Jan 10, 20XX
Year 2	Jan 1 – Dec 31, 20XX	Jan 10, 20XX
Year 3	Jan 1 – Dec 31, 20XX	Jan 10, 20XX
Year 4	Jan 1 – Dec 31, 20XX	Jan 10, 20XX
Year 5	Jan 1 – Jun 30, 20XX	Jul 10, 20XX

Virginia DEQ
Deborah L. DeBiasi
804-698-4028 dldebiasi@deq.virginia.gov

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 01/10/05
File: WETLIM10.xls
(MIX.EXE required also)

Enter data in the cells with blue type:

Entry Date:	03/28/12
Facility Name:	JRCC
VPDES Number:	VA0073300
Outfall Number:	1

Acute Endpoint/Permit Limit — **Use as LC_{50} in Special Condition, as TUa on DMR**

ACUTE 5.252481324 TUa — LC_{50} = 20 % Use as 5.00 TUa

ACUTE WLAa 10.7737705

Note: Inform the permittee that if the mean of the data exceeds this TUa: 1.4758074 a limit may result using WLA.EXE

Chronic Endpoint/Permit Limit — **Use as NOEC in Special Condition, as TUc on DMR**

CHRONIC 52.52481324 TU_c — NOEC = 2 % Use as 50.00 TU_c

BOTH* 107.7377076 TU_c — NOEC = 1 % Use as 100.00 TU_c

AML 52.52481324 TU_c — NOEC = 2 % Use as 50.00 TU_c

ACUTE WLAa,c 107.737705

CHRONIC WLAc 35.9125683

* Both means acute expressed as chronic

Note: Inform the permittee that if the mean of the data exceeds this TUc: 21.5847921 a limit may result using WLA.EXE

Plant Flow:	1.83	MGD	
Acute 1Q10:	63.89	MGD	100 %
Chronic 7Q10:	63.89	MGD	100 %

% Flow to be used from MIX.EXE

Difuser /modeling study?

Enter Y/N N

Acute :1

Chronic :1

Are data available to calculate CV? (Y/N) N (Minimum of 10 data points, same species, needed) Go to Page 2

Are data available to calculate ACR? (Y/N) N (NOEC<LC50, do not use greater/less than data) Go to Page 3

NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use

IWC_a	2.784540475	%	Plant flow/plant flow + 1Q10
IWC_c	2.784540475	%	Plant flow/plant flow + 7Q10
Dilution, acute	35.91256831		100/IWCa
Dilution, chronic	35.91256831		100/IWCc
WLA_a	10.77377049		Instream criterion (0.3 TUa) X's Dilution, acute
WLA_c	35.91256831		Instream criterion (1.0 TUc) X's Dilution, chronic
$WLA_{a,c}$	107.7377049		ACR X's WLA_a - converts acute WLA to chronic units
ACR -acute/chronic ratio	10		LC50/NOEC (Default is 10 - if data are available, use tables Page 3)
CV-Coefficient of variation	0.6		Default of 0.6 - if data are available, use tables Page 2)
Constants eA	0.4109447		Default = 0.41
eB	0.6010373		Default = 0.60
eC	2.4334175		Default = 2.43
eD	2.4334175		Default = 2.43 (1 samp) No. of samples 1

****The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.**

$LTA_{a,c}$	44.27423883		WLAa,c X's eA				
LTA_c	21.58479309		WLAc X's eB			Rounded NOEC's	%
MDL** with $LTA_{a,c}$	107.7377076	TU_c	NOEC =	0.928180	(Protects from acute/chronic toxicity)	NOEC = 1	%
MDL** with LTA_c	52.52481324	TU_c	NOEC =	1.903862	(Protects from chronic toxicity)	NOEC = 2	%
AML with lowest LTA	52.52481324	TU_c	NOEC =	1.903862	Lowest LTA X's eD	NOEC = 2	

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

						Rounded LC50's	%
MDL with $LTA_{a,c}$	10.77377076	TU_a	LC50 =	9.281801	%	LC50 = 10	%
MDL with LTA_c	5.252481324	TU_a	LC50 =	19.038621	%	LC50 = 20	

Virginia DEQ
Deborah L. DeBiasi
804-698-4028 dldebiasi@deq.virginia.gov

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

δ^2 = 0.3074847

δ = 0.554513029

Using the log variance to develop eA
(P. 100, step 2a of TSD)

Z = 1.881 (97% probability stat from table

A = -0.88929666

eA = 0.410944686

Using the log variance to develop eB
(P. 100, step 2b of TSD)

δ_4^2 = 0.086177696

δ_4 = 0.293560379

B = -0.50909823

eB = 0.601037335

Using the log variance to develop eC
(P. 100, step 4a of TSD)

δ^2 = 0.3074847

δ = 0.554513029

C = 0.889296658

eC = 2.433417525

Using the log variance to develop eD
(P. 100, step 4b of TSD)

n = **1** This number will most likely stay as "1", for 1 sample/month.

δ_n^2 = 0.3074847

δ_n = 0.554513029

D = 0.889296658

eD = 2.433417525

	Vertebrate IC_{25} Data or LC_{50} Data	LN of data	Invertebrate IC_{25} Data or LC_{50} Data	LN of data
	**********		**********	
1			1	
2			2	
3			3	
4			4	
5			5	
6			6	
7			7	
8			8	
9			9	
10			10	
11			11	
12			12	
13			13	
14			14	
15			15	
16			16	
17			17	
18			18	
19			19	
20			20	
St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA	NEED DATA
Mean	0	0	Mean	0	0
Variance	0	0.000000	Variance	0	0.000000
CV	0		CV	0	

Virginia DEQ
Deborah L. DeBiasi
804-698-4028 dldebiasi@deq.virginia.gov

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC. LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Table 1. Result:	Vertebrate ACR	0
Table 2. Result:	Invertebrate ACR	0
	Lowest ACR	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Table 3. Convert LC_{50}'s and NOEC's to Chronic TU's for use in WLA.EXE

ACR used: 10

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA	100	1.000000
2		NO DATA	12.5	8.000000
3		NO DATA	100	1.000000
4		NO DATA	100	1.000000
5		NO DATA	100	1.000000
6		NO DATA	50	2.000000
7		NO DATA	100	1.000000
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50, enter it here: NO DATA %LC_{50}

NO DATA TUa

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring		Limit	
	% Effluent	TUc	% Effluent	TUc
Dilution series based on data mean	4.6	21.58479		
Dilution series to use for limit			2	50
Dilution factor to recommend:	0.2152415		0.1414214	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	21.5	4.65	14.1	7.07
	4.6	21.58	2.0	50.00
	1.0	100.28	0.3	353.55
	0.21	465.90	0.0	2500.00
Extra dilutions if needed	0.05	2164.56	0.0	17677.67
	0.01	10056.42	0.0	125000.00

3/28/2012 11:10:09 AM

Facility = James River Cogeneration Company
Chemical = C. dubia - acute
Chronic averaging period = 4
WLAa = 11
WLAc = NA
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 7
Expected Value = 2.14285
Variance = 1.65306
C.V. = 0.6
97th percentile daily values = 5.21446
97th percentile 4 day average = 3.56526
97th percentile 30 day average= 2.58439
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1.0
8.0
1.0
1.0
1.0
2.0
1.0

3/28/2012 11:11:00 AM

Facility = James River Cogeneration Company
Chemical = P. promelas - acute
Chronic averaging period = 4
WLAa = 11
WLAc = NA
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 5
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1.0
1.0
1.0
1.0
1.0

Hammond, Andrew (DEQ)

From: DeBiasi, Deborah (DEQ)
Sent: Wednesday, March 07, 2012 2:21 PM
To: Hammond, Andrew (DEQ)
Subject: RE: VA0073300 - James River Cogeneration Company - WET Memo

Good job, Drew – if their flow increases significantly, we may consider chronic monitoring down the road. They already meet the applicability criterion of being over 1% of the 7Q10, but I don't think it's necessary at this time.

Deborah L. DeBiasi, Virginia DEQ
Office of Water Permit and Compliance Assistance Programs
Email: Deborah.DeBiasi@deq.virginia.gov
PH: 804-698-4028

From: Hammond, Andrew (DEQ)
Sent: Wednesday, March 07, 2012 2:18 PM
To: DeBiasi, Deborah (DEQ)
Subject: RE: VA0073300 - James River Cogeneration Company - WET Memo

Hi Deborah,

The proposed draft permit language has been revised as suggested, see attached.

Thanks,
Drew

Andrew J. Hammond II, P.E.
Water Permit Writer
Dept. of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060
Ph: 804.527.5048
Fx: 804.527.5106
Andrew.Hammond@deq.virginia.gov

From: DeBiasi, Deborah (DEQ)
Sent: Wednesday, March 07, 2012 10:27 AM
To: Hammond, Andrew (DEQ)
Subject: RE: VA0073300 - James River Cogeneration Company - WET Memo

The only comment would be to insert the word "statistically" or use "by STATS.exe" here, so that the permittee knows how the data will be looked at.

The test data will be evaluated statistically by DEQ for reasonable potential at the conclusion of the permit term.

Deborah L. DeBiasi, Virginia DEQ
Office of Water Permit and Compliance Assistance Programs
Email: Deborah.DeBiasi@deq.virginia.gov
PH: 804-698-4028

Attachment L

Outfall 101 Limitation Evaluations

4/18/2012 11:15:38 AM

Facility = James River Genco, LLC
Chemical = Dissolved Chromium III (Outfall 101)
Chronic averaging period = 4
WLAa = 16000 ug/L
WLAc = 2000 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683 ug/L
97th percentile 4 day average = 332.758 ug/L
97th percentile 30 day average= 241.210 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

200 ug/L

The total recoverable chromium limitation (200 ug/L or 0.2 mg/L) was entered into STATS along with the dissolved Chromium III wasteload allocations from MSTRANTI. No additional permit limitations are needed. A human health water quality standard does not exist for this effluent parameter.

4/18/2012 11:18:29 AM

Facility = James River Genco, LLC
Chemical = Dissolved Chromium VI (Outfall 101)
Chronic averaging period = 4
WLAa = 570 ug/L
WLAc = 400 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683 ug/L
97th percentile 4 day average = 332.758 ug/L
97th percentile 30 day average= 241.210 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

200 ug/L

The total recoverable chromium limitation (200 ug/L or 0.2 mg/L) was entered into STATS along with the dissolved Chromium VI wasteload allocations from MSTRANTI. No additional permit limitations are needed. A human health water quality standard does not exist for this effluent parameter.

4/18/2012 11:19:07 AM

Facility = James River Genco, LLC
Chemical = Dissolved Zinc (Outfall 101)
Chronic averaging period = 4
WLAa = 3200 ug/L
WLAc = 3200 ug/L
Q.L. = 0.1 ug/L
# samples/mo. = 4
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 1000
Variance = 360000
C.V. = 0.6
97th percentile daily values = 2433.41 ug/L
97th percentile 4 day average = 1663.79 ug/L
97th percentile 30 day average= 1206.05 ug/L
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1000 ug/L

The total recoverable zinc limitation (1000 ug/L or 1.0 mg/L) was entered into STATS along with the dissolved zinc wasteload allocations from MSTRANTI. No additional permit limitations are needed. The zinc effluent limitation is well below the human health wasteload allocation of 930,000 ug/L.

Attachment M

NPDES Permit Rating Work Sheet

NPDES PERMIT RATING WORK SHEET

☐ Regular Addition
☐ Discretionary Addition
☒ Score change, but no status change
☐ Deletion

NPDES No. VA0073300

Facility Name: James River Genco, LLC

County: City of Hopewell

Receiving Water: Gravelly Run

Reach Number: _____

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?
1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate
☐ YES; score is 600 (stop here) ☒ NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

☐ YES; score is 700 (stop here)
☒ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary SIC Code: 4911 Other SIC Codes: 4961, 4931
Industrial Subcategory Code: 002 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	15	☐ 7.	7	35
☐ 1.	1	5	☐ 4.	4	20	☐ 8.	8	40
☐ 2.	2	10	☐ 5.	5	25	☐ 9.	9	45
			☒ 6.	6	30	☐ 10.	10	50

Code Number Checked: 6

Total Points Factor 1: 30

FACTOR 2: Flow/Stream Flow Volume (*Complete either Section A or Section B; check only one)*

Section A ? Wastewater Flow Only Considered

Wastewater Type (See Instructions)		Code	Points
Type I: Flow < 5 MGD	☐	11	0
Flow 5 to 10 MGD	☐	12	10
Flow > 10 to 50 MGD	☐	13	20
Flow > 50 MGD	☐	14	30
Type II: Flow < 1 MGD	☐	21	10
Flow 1 to 5 MGD	☐	22	20
Flow > 5 to 10 MGD	☐	23	30
Flow > 10 MGD	☐	24	50
Type III: Flow < 1 MGD	☐	31	0
Flow 1 to 5 MGD	☒	32	10
Flow > 5 to 10 MGD	☐	33	20
Flow > 10 MGD	☐	34	30

Section B ? Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	☐	41	0
	10 % to < 50 %	☐	42	10
	> 50 %	☐	43	20
Type II:	< 10 %	☐	51	0
	10 % to <50 %	☐	52	20
	> 50 %	☐	53	30

Code Checked from Section A or B: 32

Total Points Factor 2: 10

FACTOR 3: Conventional Pollutants *(only when limited by the permit)*

A. Oxygen Demanding Pollutant: (check one) ☐ BOD ☐ COD ☐ Other: _____

			Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	☐	100 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: N/A

Points Scored: 0

B. Total Suspended Solids (TSS)

			Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	☒	100 to 1000 lbs/day	2	5
	☐	> 1000 to 5000 lbs/day	3	15
	☐	> 5000 lbs/day	4	20

Code Checked: 2

Points Scored: 5

C. Nitrogen Pollutant: (check one) ☐ Ammonia ☐ Other: _____

		Nitrogen Equivalent	*Code*	*Points*
Permit Limits: (check one)	☐	< 300 lbs/day	1	0
	☐	300 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: N/A

Points Scored: 0

Total Points Factor 3: 5

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

☒ YES (If yes, check toxicity potential number below)

☐ NO (If no, go to Factor 5)

Determine the *human health* toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column ? check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	0	☐ 7.	7	15
☐ 1.	1	0	☐ 4.	4	0	☐ 8.	8	20
☐ 2.	2	0	☐ 5.	5	5	☐ 9.	9	25
			☒ 6.	6	10	☐ 10.	10	30

Code Number Checked: 6

Total Points Factor 4: 10

FACTOR 5: Water Quality Factors

A. Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge:

		Code	Points
☐	Yes	1	10
☒	No	2	0

B. Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?

		Code	Points
☒	Yes	1	0
☐	No	2	5

C. Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?

		Code	Points
☐	Yes	1	10
☒	No	2	0

Code Number Checked: A: 2 B: 1 C: 2

Points Factor 5: A: 0 + B: 0 + C: 0 = 0 **Total**

FACTOR 6: Proximity to Near Coastal Waters

A. Base Score: Enter flow code here (from Factor 2): 32 *Enter the multiplication factor that corresponds to the flow code:* 0.05

Check appropriate facility HPRI Code (from PCS):

	HPRI#	*Code*	*HPRI Score*
☐	1	1	20
☐	2	2	0
☒	3	3	30
☐	4	4	0
☐	5	5	20

HPRI code checked: 3

Flow Code	*Multiplication Factor*
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

Base Score: (HPRI Score) 30 X (Multiplication Factor) 0.05 = 1.5 (TOTAL POINTS A)

B. Additional Points ☐ *NEP Program*
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

	Code	Points
☒ Yes	1	10
☐ No	2	0

C. Additional Points ☐ *Great Lakes Area of Concern*
For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)

	Code	Points
☐ Yes	1	10
☒ No	2	0

Code Number Checked: A: 3 B: 1 C: 2

Points Factor 6: A: 1.5 + B: 10 + C: 0 = 11.5 **Total**

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	30
2	Flows/Streamflow Volume	10
3	Conventional Pollutants	5
4	Public Health Impacts	10
5	Water Quality Factors	0
6	Proximity to Near Coastal Waters	11.5
	TOTAL (Factors 1 through 6)	66.5

S1. Is the total score equal to or greater than 80? ☐ Yes (Facility is a major) ☒ No

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ No

☐ Yes (Add 500 points to the above score and provide reason below):

Reason:

NEW SCORE: 66.5

OLD SCORE: 60

Permit Reviewer's Name: Andrew Hammond

Permit Reviewer's Number: (804) 527-5048

Date: 4/9/2012

Attachment N

Quantification Level Development

Derivation of Quantification Levels (QLs) for Total Recoverable Chromium & Total Recoverable Zinc

Total Recoverable Chromium

Assumptions:

Log-normal distribution
Coefficient of Variation (CV) = 0.60
97th Percentile Occurrence Probability (z score = 1.88079)

Where:

Daily Maximum Limitation (DML)	= 0.2 mg/L
Average Monthly Limitation (AML)	= 0.2 mg/L
Number of Samples per Month (n)	= 1 (assumed for monitoring frequencies encompassing multiple months)
Long Term Average (LTA)	= unknown

Long Term Average (LTA) to ensure compliance with DML:

$$\sigma^2 = \ln(CV^2 + 1) = \ln(0.60^2 + 1) = 0.30748$$

$$\sigma = \sqrt{\sigma^2} = \sqrt{0.30748} = 0.55451$$

$$LTA = \frac{DML}{e^{[z\sigma - 0.5\sigma^2]}} = \frac{0.2\ mg/L}{e^{[(1.88079 \times 0.55451) - (0.5 \times 0.30748)]}} = 0.082\ mg/L$$

Long Term Average (LTA) to ensure compliance with AML:

$$\sigma^2 = \ln\left(\frac{CV^2}{n} + 1\right) = \ln\left(\frac{0.60^2}{1} + 1\right) = 0.30748$$

$$\sigma = \sqrt{\sigma^2} = \sqrt{0.30748} = 0.55451$$

$$LTA = \frac{DML}{e^{[z\sigma - 0.5\sigma^2]}} = \frac{0.2\ mg/L}{e^{[(1.88079 \times 0.55451) - (0.5 \times 0.30748)]}} = 0.082\ mg/L$$

Therefore, the QL for Total Recoverable Chromium should be set equal to 0.082 mg/L.

Total Recoverable Zinc

Assumptions:

Log-normal distribution
Coefficient of Variation (CV) = 0.60
97th Percentile Occurrence Probability (z score = 1.88079)

Where:

Daily Maximum Limitation (DML)	= 1.0 mg/L
Average Monthly Limitation (AML)	= 1.0 mg/L
Number of Samples per Month (n)	= 4
Long Term Average (LTA)	= unknown

Long Term Average (LTA) to ensure compliance with DML:

$$\sigma^2 = \ln(CV^2 + 1) = \ln(0.60^2 + 1) = 0.30748$$

$$\sigma = \sqrt{\sigma^2} = \sqrt{0.30748} = 0.55451$$

$$LTA = \frac{DML}{e^{[z\sigma - 0.5\sigma^2]}} = \frac{1.0\ mg/L}{e^{[(1.88079 \times 0.55451) - (0.5 \times 0.30748)]}} = 0.41\ mg/L$$

Long Term Average (LTA) to ensure compliance with AML:

$$\sigma^2 = \ln\left(\frac{CV^2}{n} + 1\right) = \ln\left(\frac{0.60^2}{4} + 1\right) = 0.08618$$

$$\sigma = \sqrt{\sigma^2} = \sqrt{0.08618} = 0.29356$$

$$LTA = \frac{DML}{e^{[z\sigma - 0.5\sigma^2]}} = \frac{1.0\ mg/L}{e^{[(1.88079 \times 0.29356) - (0.5 \times 0.08618)]}} = 0.60\ mg/L$$

Therefore, the QL for Total Recoverable Zinc should be set equal to 0.41 mg/L.